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EUSTACE MILES.

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BUILDERS OF THE BODY

Or, Lessons on Food Values

By

EUSTACE MILES, M.A.

Member of the Executive Committee of the National League for Physical Education and Improvement, 1905–1906
Author of "A Boy's Control and Self-Expression," "How to Prepare Essays, etc."
Editor of Cassell's Physical Educator
Amateur Champion of England at Tennis, 1899 *to* 1903, 1905, 1906; *Holder of the Gold Prize*

and

MISS MARIELLA JOHN

Principal of The Eustace Miles Cookery School

LONDON
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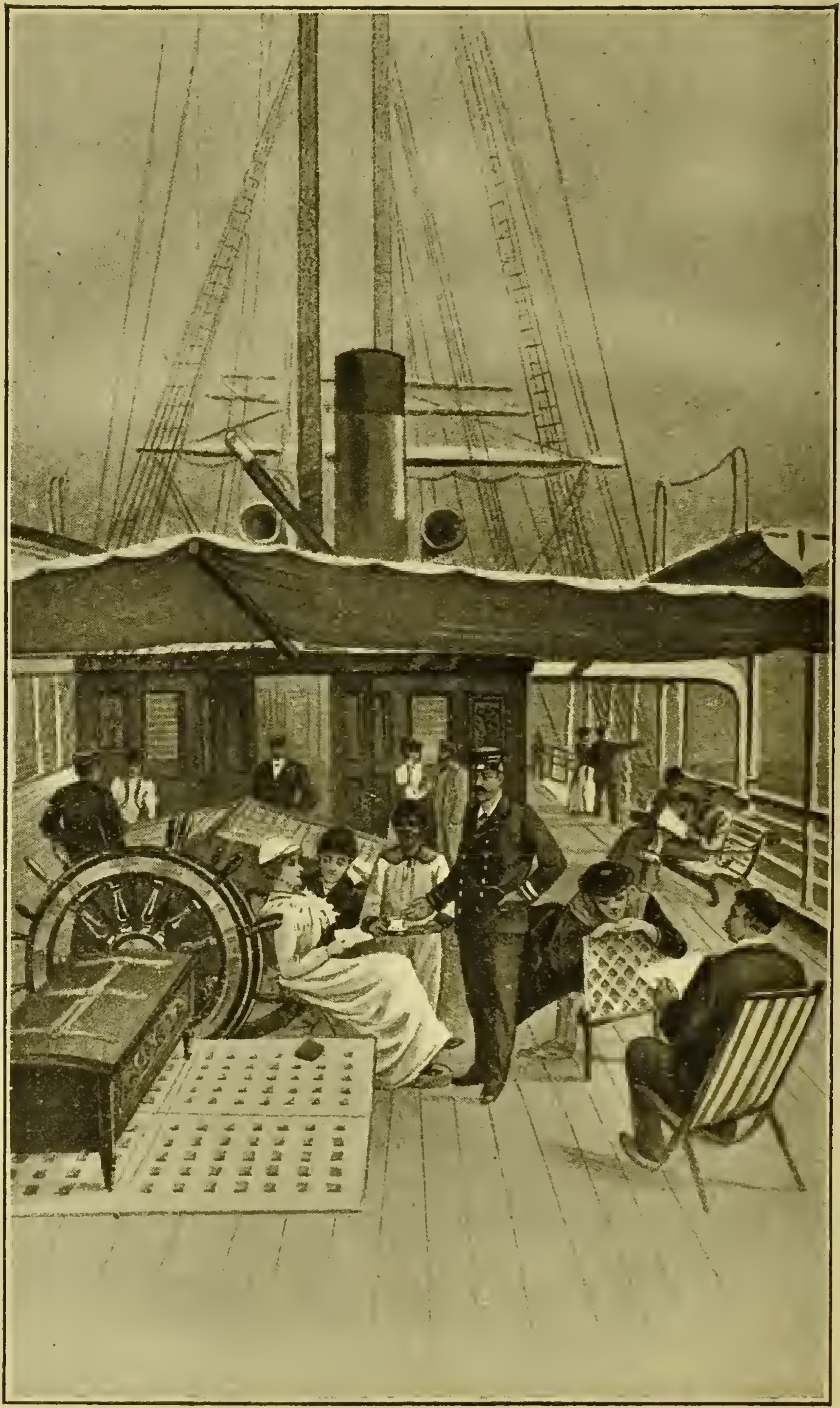

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FIG. 1.—ONE OF THE SEVEN MEALS ON A STEAMER.

See page 3.

BUILDERS OF THE BODY

THE BUILDERS

ALL are architects of Fate,
  Working in these walls of Time:
Some with massive deeds and great,
  Some with ornaments of rhyme.

Nothing useless is, or low;
  Each thing in its place is best;
And what seems but idle show
  Strengthens and supports the rest.

For the structure that we raise
  Time is with materials filled;
Our to-days and yesterdays
  Are the blocks with which we build.

Truly shape and fashion these;
  Leave no yawning gaps between;
Think not, because no man sees,
  Such things will remain unseen.

In the elder days of Art,
  Builders wrought with greatest care
Each minute and unseen part;
  For the Gods see everywhere.

Let us do our work as well,
  Both the unseen and the seen;
Make the house, where Gods may dwell,
  Beautiful, entire, and clean.

Else our lives are incomplete,
  Standing in these walls of Time,
Broken stairways, where the feet
  Stumble as they seek to climb.

Build to-day, then, strong and sure,
  With a firm and ample base,
And ascending and secure
  Shall to-morrow find its place.

LONGFELLOW.

I

WHY WE EAT AND DRINK

THERE are some people who eat only once a day, not because they have not enough money to buy two meals, but because they believe they are healthier when they eat only once a day. There are, on the other hand, some who eat seven times a day. A passenger on a large steamer can have a cup of tea and biscuit when he wakes, then a large breakfast at half-past eight, a sandwich or some beef-tea at eleven, a large lunch at one-thirty, bread and butter and cake with tea at four-thirty, perhaps an "appetiser" before dinner, then a large dinner of many courses followed by coffee, and last of all—a little supper!

Now, whether one meal is eaten, or two or three or four or more, why is the food taken? Why do people eat?

* * * * *

Those who eat only once a day probably eat because they feel hungry and because they *are* healthily hungry.

Those who eat seven or eight times a day, eat for other reasons. Most of the meals on the steamer are already paid for by the passengers, and are offered to the passengers without extra charge. There appears to be very little else to do on board except to eat and drink, talk, dress and undress, and sleep. It is usual to take a meal at a certain time. The tastes of the foods are pleasant. Besides, it seems so much more social to eat and drink with others than to sit there and refuse one thing after another. These are some of the reasons why most of the passengers eat.

And perhaps they even *feel* hungry. They may not be truly hungry, their stomach may not be clean and waiting for food, and giving its signal that it is ready to digest wholesome food. But the people have a desire to eat. If they are not hungry, at least they feel as if they were, and they are too weak-minded to say to themselves, " No, I don't really need all this food, and so I *will not* eat too much." They are uncontrolled; they are greedy.

It is not only on big steamers that people take too many meals a day. There are men and women on land who take what is equal to seven meals a day; for their midday meal is equal to two or three meals of a healthy person. So is their evening meal. I have seen banquets in which one person had enough to form three meals, all at a single sitting. You could divide his meal into meals ample for three ordinary individuals. This person ate so much because he was uncontrolled—greedy.

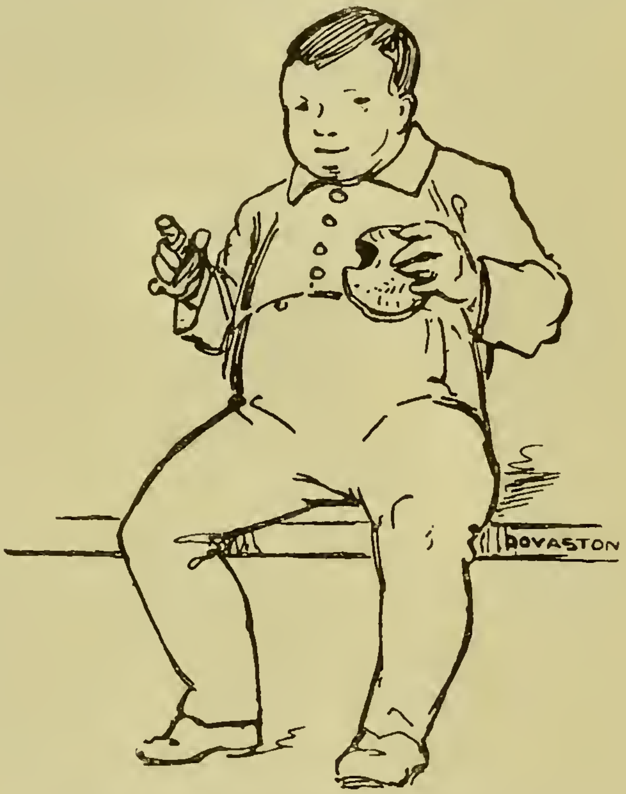


FIG. 2.—PICKWICK'S FAT BOY.

Here, then, are some of the reasons why people *do* eat. Now for some of the reasons why you *should* eat just enough of the right things at the right times, and—in the right way.

Your first good reason for eating is hunger.

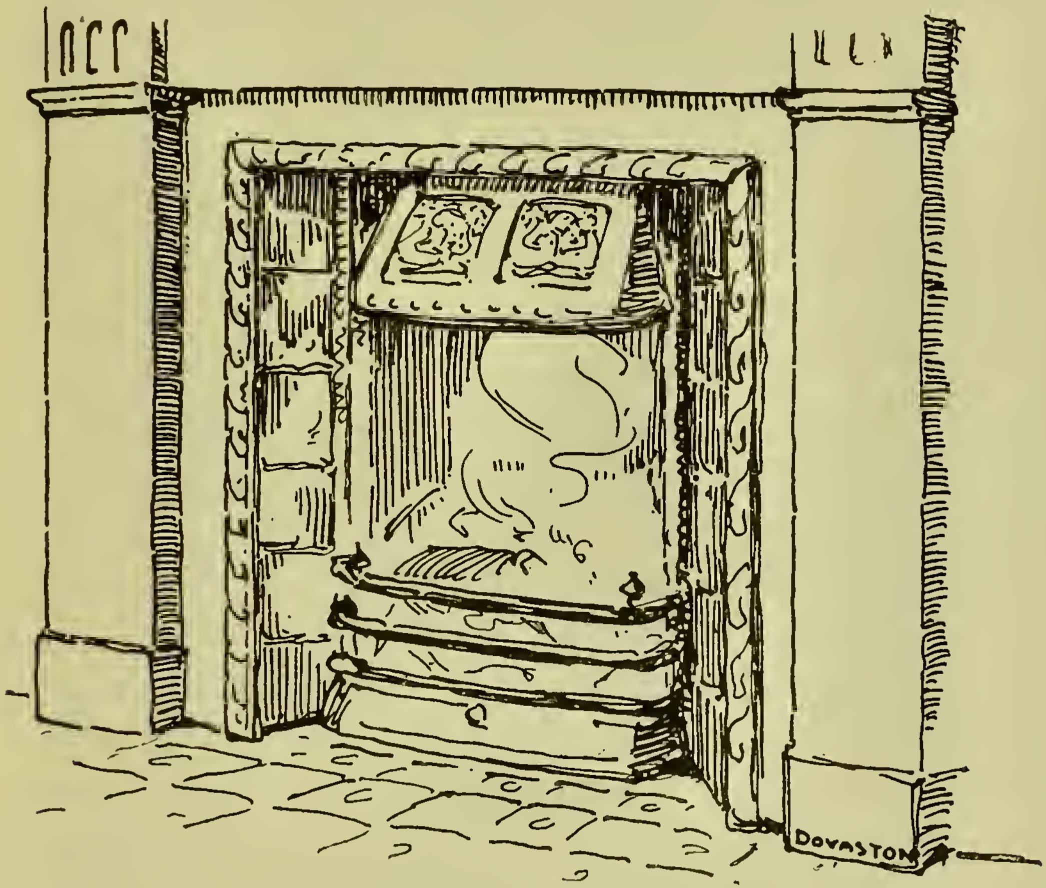


FIG. 3.—FIREPLACE.

Your stomach is free from any remains of the last meal ; perhaps it has in it already a little of its juice, called gastric juice, waiting to digest some of the food. You have an appetite for something wholesome, no matter how plain. You feel that you would be satisfied with some crusts of bread, and that you would enjoy them. This is real hunger, and the pleasure that you get by satisfying it is a healthy one, so long as you do not eat too fast.

Then you have to repair the parts of your body which you have used up. Your body—as you will see directly—is rather like the fireplace in which a fire is burning, and the wood and coals that make the fire as well (Fig. 3). Your body needs not only its wood and coals, its fuel, which it can get from such foods as butter and potatoes, but also a new fireplace. Your body actually consumes its own fireplace, its own tissues, as they are called : these it can restore by such foods as beef, cheese, eggs, and haricot beans.

That is what our body is doing. It is burning up its fuel (some of this is stored up as fat), and it is using up its tissues. We need materials for fuel and tissues. We need enough—perhaps just a little more than enough, so as to be on the safe side ; but we do not need far too much, taken—as so many people take food and make up their fires—in large masses thrown in anyhow.

Now, is there any other reason why we should eat, besides this—to give our bodies fuel, which they, like engines, can turn into power and work, and to rebuild our bodies ?

There is another reason why we should eat—or, rather, why we should drink. That is, in order that we may clean ourselves. One of the best drinks for this purpose is pure water, which we find in fresh fruits and salads and well-cooked vegetables.

Have you ever noticed a dirty pond or lake with a stream of water running through it?

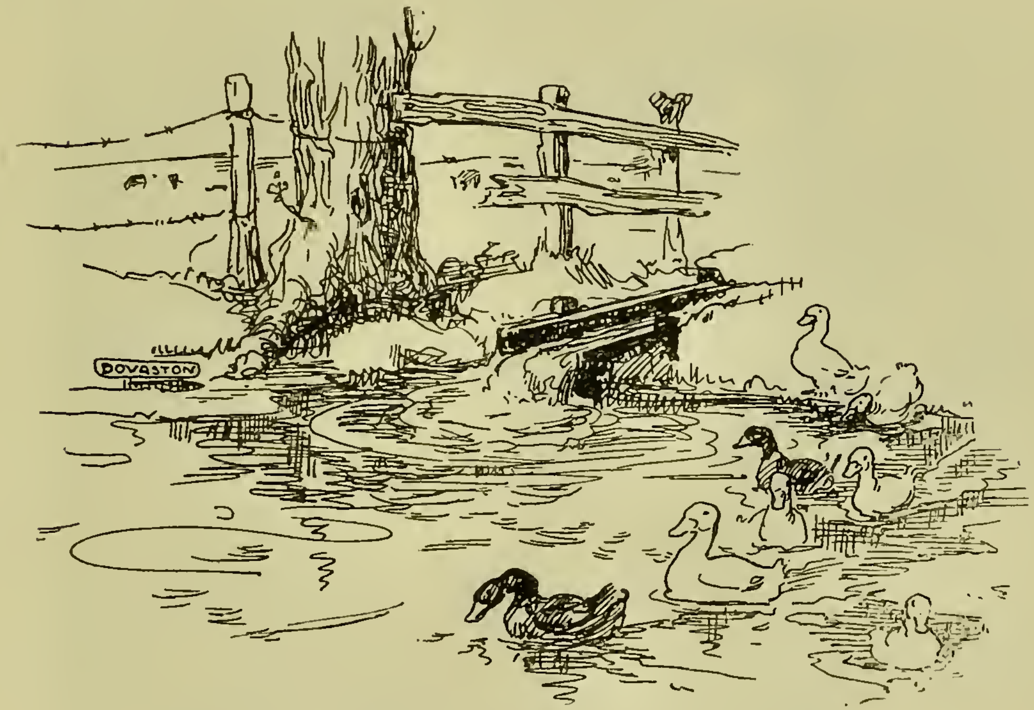


Fig. 4.—Stream Clearing out Pond.

Here is a picture of one. As the stream goes along it travels at a great speed, and takes with it lots of dirt and refuse that would otherwise choke up the pond and make it unpleasant and unhealthy. In a very similar way the tracts inside our bodies along which food is carried are cleansed by pure soft water that we drink or take in fruit or well-cooked vegetables. Perhaps you never thought you were taking water when you ate apples or plums or potatoes. But, when you look closely at the chart on the wall, you will see that all the fresh fruits and vegetables named in it have a great deal of water in them. With this water is mixed "salts" that are nice to take—not bitter and strong like the medicines that are sold in shops.

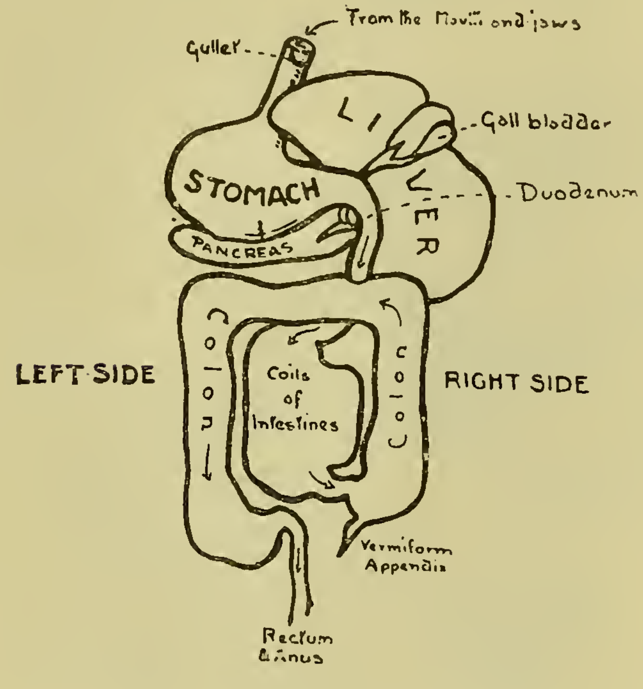


Fig. 5.—Digestive Tract.

This picture (Fig. 5) will show you what happens to your food inside your body.

You will see if you look at it carefully that it is very wisely ordered. Useless or even harmful foods, when they are taken a little at a time, can be washed out of the body by plenty of pure water and "salts." Then they do not get into the blood and make it unhealthy. You have often been told that washing is good for your skin. It makes you nice to look at, nice to touch, and much more comfortable to yourself, much more healthy.

Now you know that water inside the body is quite as useful as water to your skin. Take plenty of it in the early morning and at night, and you will not be troubled so often by having to take nasty powders and sickly medicines that make you pull wry faces.

Is there any other reason why we should eat?

FIG. 6.
CHILD AFTER TAKING MEDICINE.

FIG. 7.
CHILD AFTER TAKING FRUIT, VEGETABLES, OR CLEAN, COOL WATER.

Yes, there is a social reason. In all countries, at almost all times in the world's history, people have come together at meals. Many members of very busy families to-day scarcely ever come together except at meals. We hear people say, "I never see you except at dinner." The father is away at his work, the mother is looking after the house and the children—until the evening.

Meal-times are times of rest and change for the body and mind. And change is often the best kind of rest. Meal-times make us use muscles, the muscles of the stomach and other organs, not the muscles of the arms and legs which we have been using at our work.

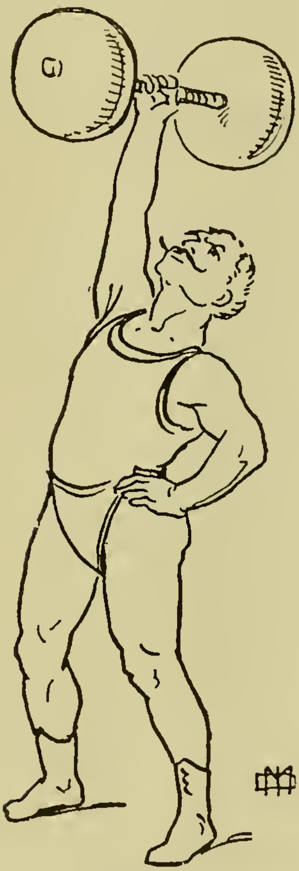


Fig. 8.
Weight-lifter.

Have you ever tried to lift a very heavy weight — as the man in the picture is doing ? If so, you will have noticed that the fat part of your upper arm seemed to get strained while you were trying. This part of the arm is called the biceps muscle, and, when a man is able to lift very heavy weights by constant practice, this muscle gets hard and big. Here is a picture of a weight-lifter. You can see his big biceps.

All the movements of our bodies are made more swift and more strong when our muscles are given plenty of the right exercise, and are kept in what is called good condition. When we eat, certain movements are made by the muscles about our waists. Eating is a sort of exercise for these inner muscles.

Now these inner muscles, although they cannot easily be understood from a picture, are very useful to the body, and deserve just as much care as the muscles of the arms.

Next time you are in a hurry and eat too fast, think that you are doing harm to a part of your body which deserves better treatment. Perhaps if you don't remember your duty to these muscles, they will some day annoy you by becoming flabby and making you very fat, and heavy, and uncomfortable, as Pickwick's "Fat Boy" (Fig. 2) must have been when he grew older.

Meal-times make us use not only muscles but the brain. They make us use different muscles and a different part of the brain. They provide fresh work and also recreation.

We ought to eat so as to keep fit for work and play, for prayer and sleep, and whatever else is worth doing, and therefore worth doing well. It is very important to keep fit for a good night's sleep, and we can do this if we eat the right things. Without proper rest we cannot thrive.

There are many other reasons why we should eat. They are real reasons, even if we have never thought of them before, and even if we were never to think of them again.

What strikes you first when you see a person eat? He is moving his lower jaw up and down; his teeth are chewing the food (if he eats properly). We should eat to give exercise to our teeth and keep them beautiful and healthy.

Then you know how, when you chew your

food, saliva pours into your mouth. That helps to clean your mouth and your teeth, to carry down the food, and to digest some of the food. It has other uses as well. It has the effect of making us healthier, this saliva.

When the food has gone down from the mouth into the stomach, and again after it has left the stomach, there are other juices which should pour out upon it, just as the saliva has poured out upon it in the mouth itself. These juices are our own; they are, as it were, home-made; they are meant for some purpose; they are meant for the purpose of digesting our food, and making the harmful parts of our food harmless. We eat partly in order to give exercise and work to our teeth, our saliva, and other juices, which otherwise would become lazy and idle, weak and incompetent.

Is there any other reason at all why we should eat? Let us go through what we have said. Afterwards try whether you can think of another reason.

You have seen that you may eat because you feel hungry, and because eating will make you feel satisfied and comfortable and happy. You may eat to repair your body worn out by work, and to give it fuel and power. You may eat, or rather drink, to cleanse your body. You may eat because during the meal you will meet and talk with others who are eating too.

You may eat so as to give parts of your body and mind rest or a change of work. You may eat to keep fit for work and play, prayer and sleep. You may eat to use your teeth, your saliva and other juices, and some of your muscles.

You may eat also so as to get good habits, and especially the habits of quietness and thoroughness. Instead of hurrying and rushing through everything that you do, doing it carelessly and badly, you can learn, by chewing your food thoroughly, to be calm, and none the less quick and useful for that.

You can get the habits of thoroughness and carefulness by eating in a sensible way.

Now, think for a moment why you *have* eaten at different times. Probably it will be for different reasons at different times: sometimes, perhaps, because you have been greedy; sometimes because you have been hungry.

Next, think of why you should eat. Go through the reasons once more.

What should be the reasons why you eat—and why you do *not* eat.

* * * * *

So far we have asked ourselves why people eat and why they should eat. Now let us ask whether it matters what we eat or do not eat.

Has one food a different effect from another, or have all foods the same effect? Does it matter at all whether one takes beef and beer, or bread and butter and water, or cheese, or potatoes and cabbage, or sweets, or eggs and bacon ? The next chapter will answer this question.

FIG. 9.—BEEF.

FIG. 10.—LOAF.

FIG. 11.—EGG.

II

WHAT WE OWE TO FOOD

IN a chapter which will follow directly, you will see food compared with other things. Here you can compare it with bricks and other materials that form buildings. What sort of a building—a house—would you buy if

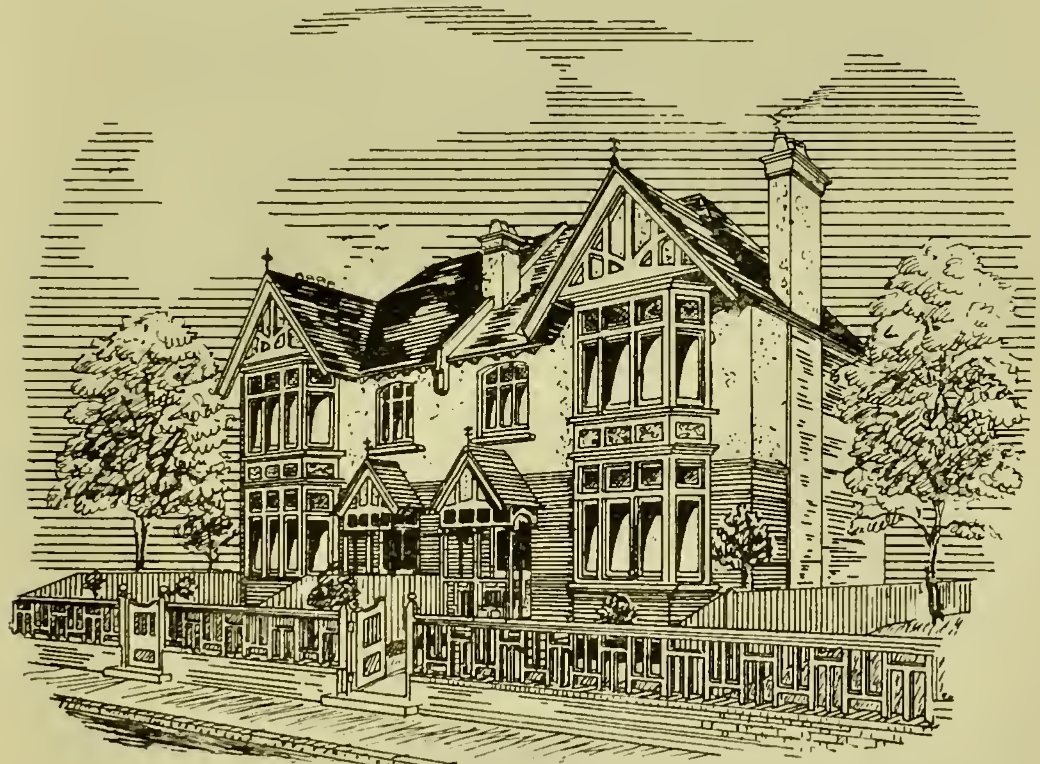


Fig. 12.—A Well Built House.

you wanted one and had enough money ? What would you call a good house ?

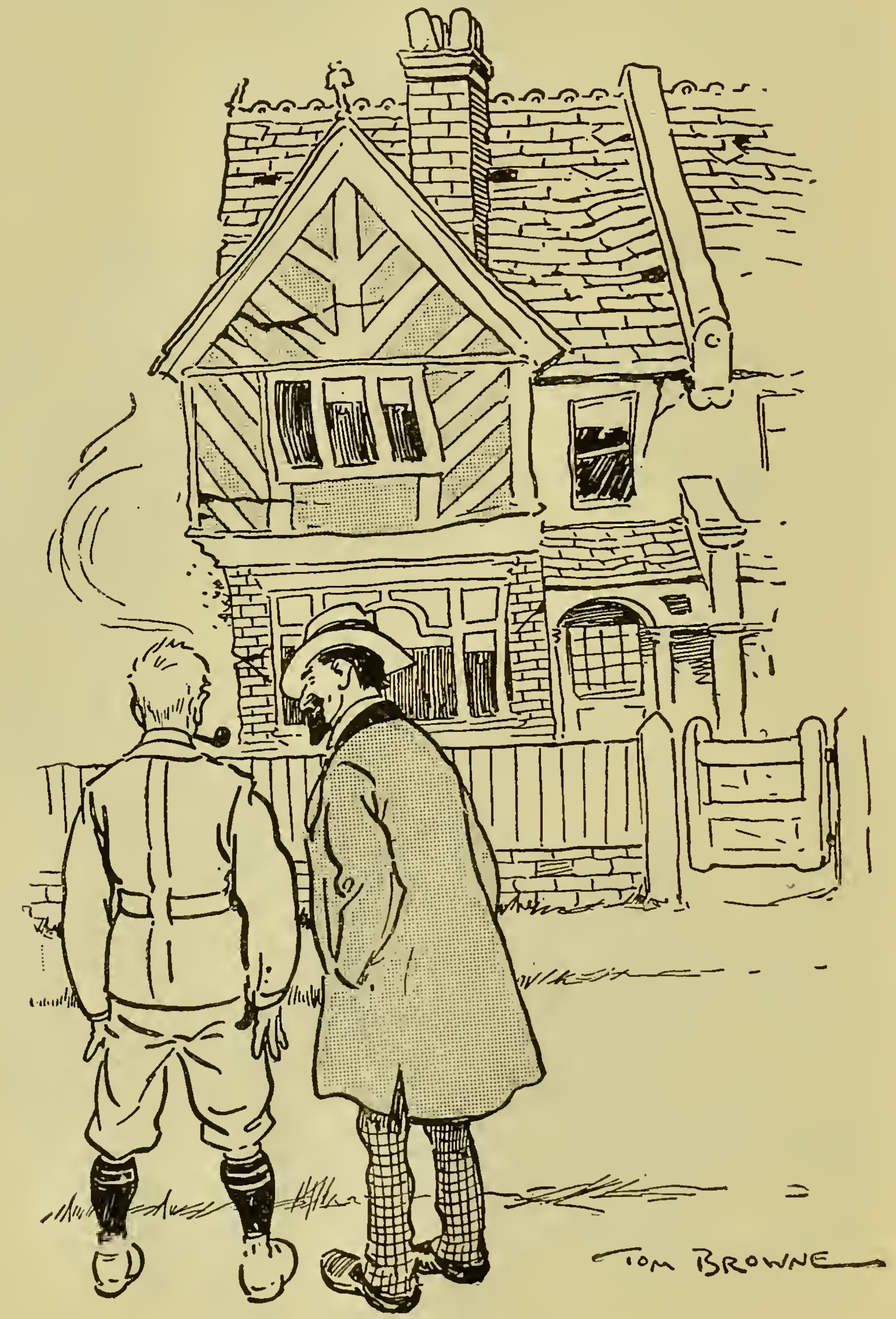


FIG. 13.—A BADLY BUILT HOUSE.

You would call a house good when it is made of good bricks and mortar, and wood, etc., when it is well put together, and kept clean and in good condition.

The goodness depends largely on what the house is made of; that is to say, on the materials of which it is made. The materials will go far to decide whether the house is good, or whether, on the other hand, it is unhealthy, unsafe, or useless. If it is made of bad bricks, mortar, wood, etc., badly put together, it will be a bad house.

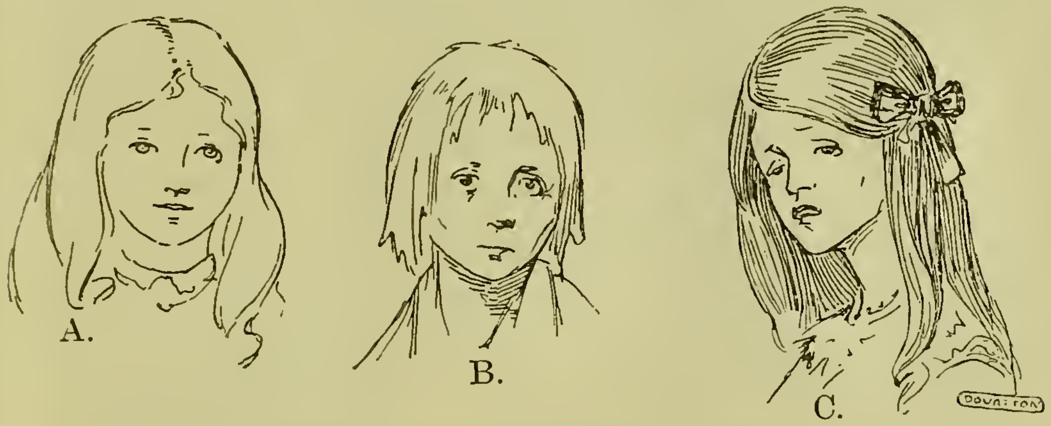


Fig. 14.—Three Children.

Food is the material of which your body is made. Your body is therefore a kind of building. It is most important that you should make this building of the right materials. In other words, it is most important that you should give yourself the right food.

You see here the difference that feeding has made in these children. The first has had plenty of good milk and other simple foods. The second has had too little food, and that not of the right sort. The third has had too much food, not of the right sort.

The difference in effect between one food and another may be very great. I will tell you a story about myself, so strange that you will scarcely believe it ; but it is quite true.

Some years ago I used to eat and drink carelessly, not because I wanted to be ill, but because I did just what other people were doing ; I ate and drank things merely because they were offered me, or were on the table in front of me. I had bad health, bad spirits ; I did not do very good work ; I was not in very good training at games ; I suffered from colds, coughs, headaches, and other misfortunes (as I thought them).

Then I took more care as to what I ate and drank. I got better health, better spirits ; I did better work ; I kept in better condition for games ; I no longer had many colds and coughs ; and in other ways I became fitter and fitter.

It will not suit every one to make just the same changes that I did. I only tell you this because I want you to understand that it is a very vital matter, this matter of food. It makes a great difference what one eats and drinks.

In my own case, I managed to find some foods which suited me better than meat had done. You will be able to read whole books full of stories about people who have made changes in their diet—changes of quite a different kind from mine—and seem to have altered their life and their looks for the better by these changes. You know how true this is of people who have taken too much beer or wine or spirit. A man takes a great deal of alcohol, and looks fat and bloated, and is altogether unwell. He gives up the alcohol, or else he takes less of it, and he becomes healthier and nicer to look at.

Or perhaps too much strong tea or coffee had given him indigestion and made him very nervous. He takes less tea or coffee, or he takes it less strong, and his digestion improves and his nervousness disappears; he enjoys his food more, works better in the day time, and sleeps better at night.

So you see it is a most important question, this one of food and drink. Not only does food form every particle of your body—but your body forms, as it were, the house of your mind: not only the house of your mind, but also the tools of your mind. It is in your body that you live. and by means of your body that you move and work.

Your mind is like a carpenter who has a lot of work to do. Your body is the cottage in which he lives, and also the tools with which he works. How can a man do good work if he has a tumble-down, draughty, damp, and thoroughly bad cottage and if he has wretched, rusty tools? Your body is to you what the carpenter's cottage and tools are to him—and more: it includes your arms, and hands, and eyes; and it is also the house of your mind. All the tools of your mind, then, as well as its house, are made out of your food. Now you see why your mind is helped by healthier food: since your body, though it may not exactly form your mind, influences it very strongly—just as your home influences you. Your body is your home.

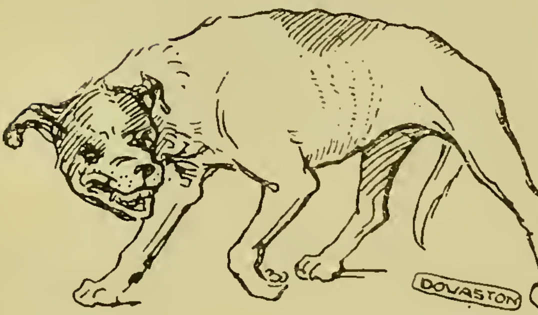


Fig. 15.—Badly-fed Dog.

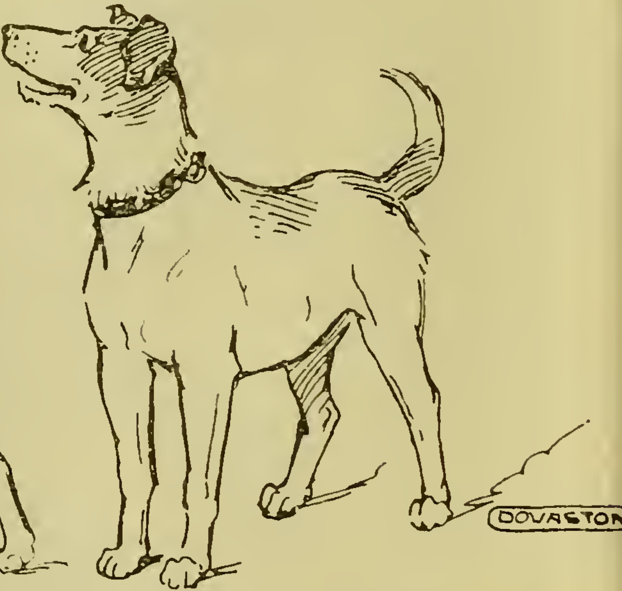


Fig. 16.—Dog Smartened Up by Better Food.

Suppose you find a wrongly-fed mangy dog (Fig. 15) with a bad temper. You take him home and keep him clean and feed him well. The chances are that he will become better looking and also better tempered. (As in Fig. 16.)

Here are three faces. All, so the German writer says, belong to the same person. A man was good-looking and bright. He took alcohol and lost his appetite for good food, and became like the second and third pictures.

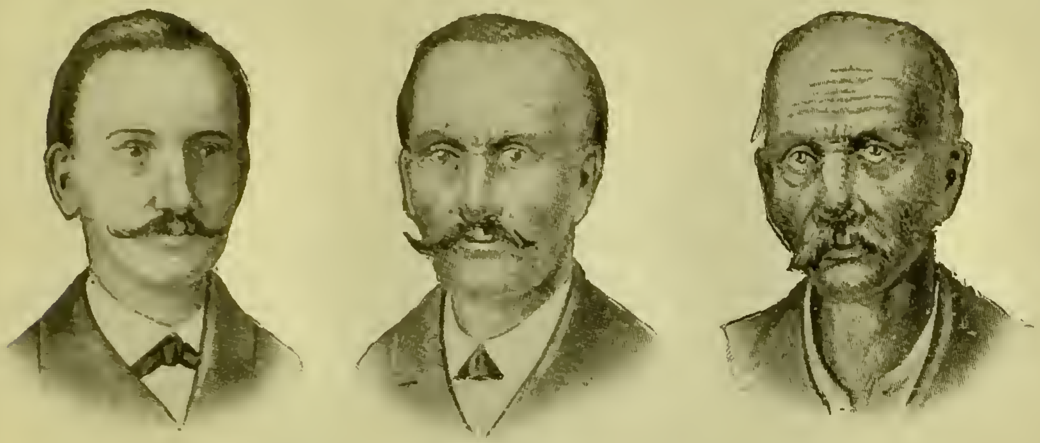


Fig. 17.—Three Stages due to Drink.

There is an old German proverb which says, "A man is what he eats." That is not quite true; he is also what he breathes, what he thinks, and so forth. But it is certainly true that man, like many animals, is greatly influenced by what he eats.

I remember a cat which was quite quiet so long as it was fed on milk and wheat and other simple foods, but, when it was given a beefsteak, it became almost mad; it scratched people; it was the same cat, but, when one had altered its food, it became as fierce as a tiger, and as restless.

It is not all a question of what you eat and drink; whether, for instance, you take beef and beer, or bread and cheese and water, or buns and sweets, pickles and tea. It is also a question of how much you eat and drink.

I have come across two cases just lately, of well-known people, who were told that they were eating too much. The doctor did not tell them that they were eating the wrong foods; he simply made a list of the foods they were eating, and told them to eat just half of everything. They followed his advice, and they tell me they have become very much healthier, on the same foods, by taking half the amount of them.

Is there anything else which makes a difference, besides what you eat and how much of it you eat?

Yes, there is the way in which you eat. Mr. Gladstone, whom you see taking his coffee, put down much of his good health to the fact that he gave his mouthfuls of food thirty or thirty-two bites each. An American, Mr. Horace Fletcher, says that he owes his present state of good health entirely to a still more thorough chewing of his food; he chews his food as long as it has any taste at all; sometimes he gives a mouthful a hundred bites or more. I know, from other cases, that this way of eating, this thorough chewing, has often made a vast difference to the state of a person's body and mind.

In this book we are asking ourselves how much we should eat, and how we should eat, and what we should eat. But we are concerned chiefly with the last question, what we should eat.

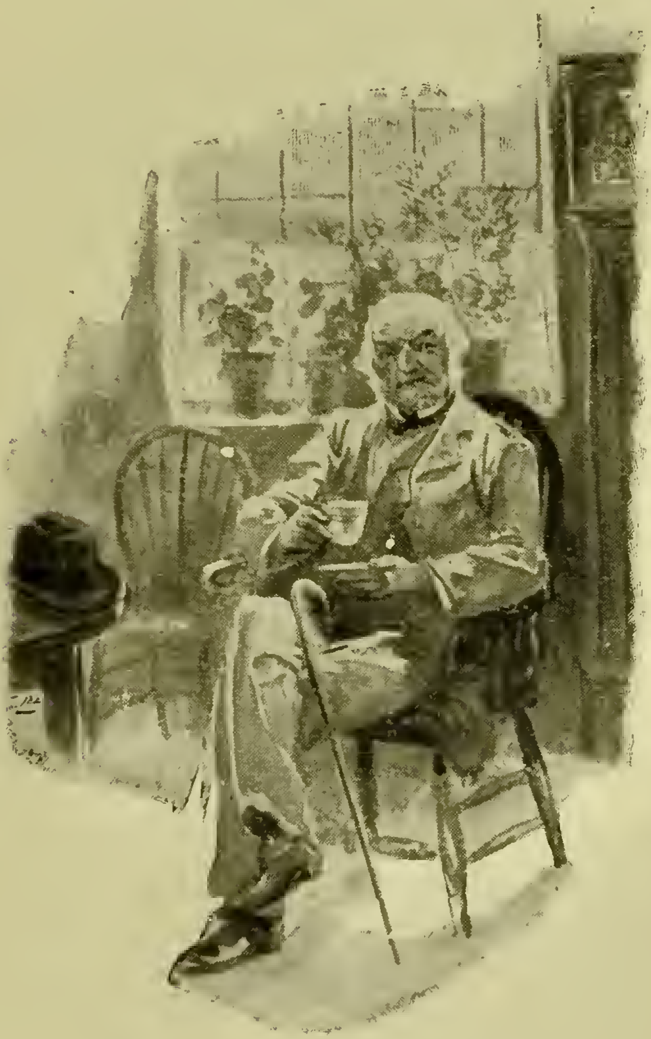


FIG. 18.—MR. GLADSTONE.

Be sure that it is a most important matter, whichever way you look at it. You eat partly to rebuild your body, and to give it fresh power and energy, and to keep it clean. You cannot do this equally well with all sorts of food ; some are better for you, some are worse.

Which are better ? Which are worse ?

And how much is better for you ?

And how should it be eaten ?

Let us be convinced that the way in which we live to-day, and the trying conditions, make it more needful than it used to be to think about these questions.

III

ABOUT CUSTOMS IN FOOD

NOT long ago, few people cared what they ate and drank, how much of it they ate and drank, or how they ate and drank it. In recent years one of the greatest changes that has come over the world, or at least over the world of people who live in cities, is this:—The questions have been asked, What should we eat and drink? How much should we eat and drink? And how should we eat and drink?

As the years go on, these questions will become more and more important. They are not going to become unimportant during our life-time. These are not like the questions which are sometimes asked in the papers: Should ladies wear this or that shape of dress? Should we go to this or that play? Such questions may be very exciting for a time, but the interest of them passes away. The question of what we should eat and drink is one that will be always before us.

Now most people are living in cities. Not long ago most people were living in the country.

To-day three-quarters of the people of England live in cities. Only one quarter of the people are living in the country, with fresh air and plenty of good exercise. What a difference that means! You know how much hungrier you feel when you have been out of doors for a healthy walk or run, or for healthy play in the fields; you know how much less hungry you feel when you have been cooped up indoors for a long while. Here is a man (Fig. 19), who gets his living by growing wheat. He lives in the open air, and eats what happens to be handy when he gets a chance. But he is hardly ever ill.

In England, formerly, there were many people who lived healthy lives of this kind, and it mattered very little to those happy people what they ate and drank. To-day there is not so much outdoor life in England. Most English people seem to want is to live in big towns, and there they are cooped up in offices with small chance of fresh air or exercise.

Now if you don't get enough fresh air and exercise you need not expect to have a good appetite, and if you have not a good appetite you must be careful what you eat.

To-day, then, we want our food to be good. Soon we shall want it to be the best that we can get, if not the best possible.

It is true that some people think too much about what they shall eat. That is a fault, But it is equally true that most people think too little; that they eat the wrong things and make themselves ill through thinking about this important question either too little or not at all.

Fig. 19.—Canadian Farmer.

So it is with clothing and washing and anything else. There is what is called a happy mean: one ought to think just enough about these things, not too little, not too much.

It is perhaps wrong to think too much about food, but this is better than not thinking at all about it.

Our safest plan is to make the best of what is put before us. Many of the soldiers in South Africa during the war had very few foods offered them; they had to make the best of what they could get.

Then, when we can get what we want, we should take the right foods; we should learn what to choose, and what to refuse.

It is a mistake not to learn this. Herbert Spencer, the great philosopher, said that a man who ill-treated his own body was guilty of sin; he called this a bodily or physical sin. One who feeds his body wrongly is ill-treating his body, and is guilty of such a sin. He is injuring the temple or home of the Holy Spirit, as St. Paul calls it. And to-day people are beginning to know this. They are beginning to reverence their bodies, and to take care of them no less than a trainer (Fig. 20), takes care of the race-horses in his charge.

This man knows quite well that, if he feeds his horse on any sort of food that comes to hand, it will have no chance in a race with other horses that have been wisely fed. And what is true of

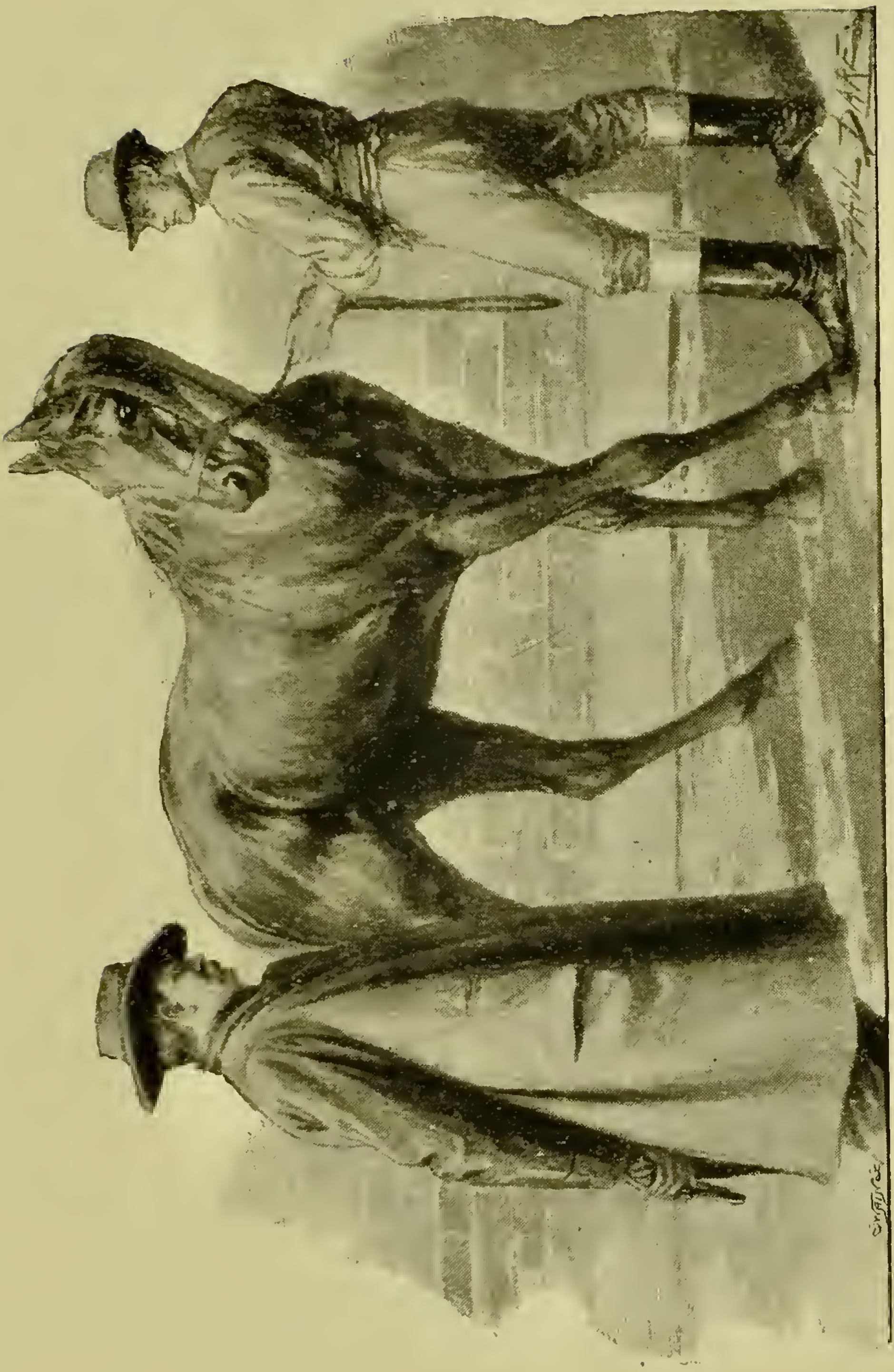


Fig. 20.—Horse and Trainer.

horses is true of men. If a man wants to win a race of any kind, the first thing he should do is to consider how he is going to feed himself. He should not think, What do I like ? but, What will help me to win ?

So all people who want to be prize-winners must be wise and ask, What foods are good for us ? What foods have been found, by experiments, to be good foods ?

People are beginning to agree that our meals should be well balanced. Think of a box of things which you will need during a journey. You would not think of filling the box entirely with one article of clothing ; you would take so many vests, so many socks or stockings, so many handkerchiefs, etc. For a journey you need the right number of different things, or, as it is called, the right proportion, so that you will have just enough and not too many for each purpose.

Now, what should be in a meal ? What is the right balance or proportion of elements ? Is it right to take at a mid-day meal a large piece of bread and a small piece of cheese, or a small piece of bread and a large piece of cheese, or only bread, or only cheese ?

This is what sensible people are beginning to ask, and what this book is written to tell you.

It is not enough to weigh out a certain amount of "food" and eat it. You will see that this plan is rather absurd if you compare foods with books, which are to be looked upon as foods for the mind. Look at a bookstall. There are lots of books. Which will do you most good if you read them? Do you ask a man for a pound of books, or for eight ounces of books? No, you choose the books you want. Perhaps you want to learn arithmetic. Very well, then, you buy a book on arithmetic; you do not ask the man for three ounces of books.

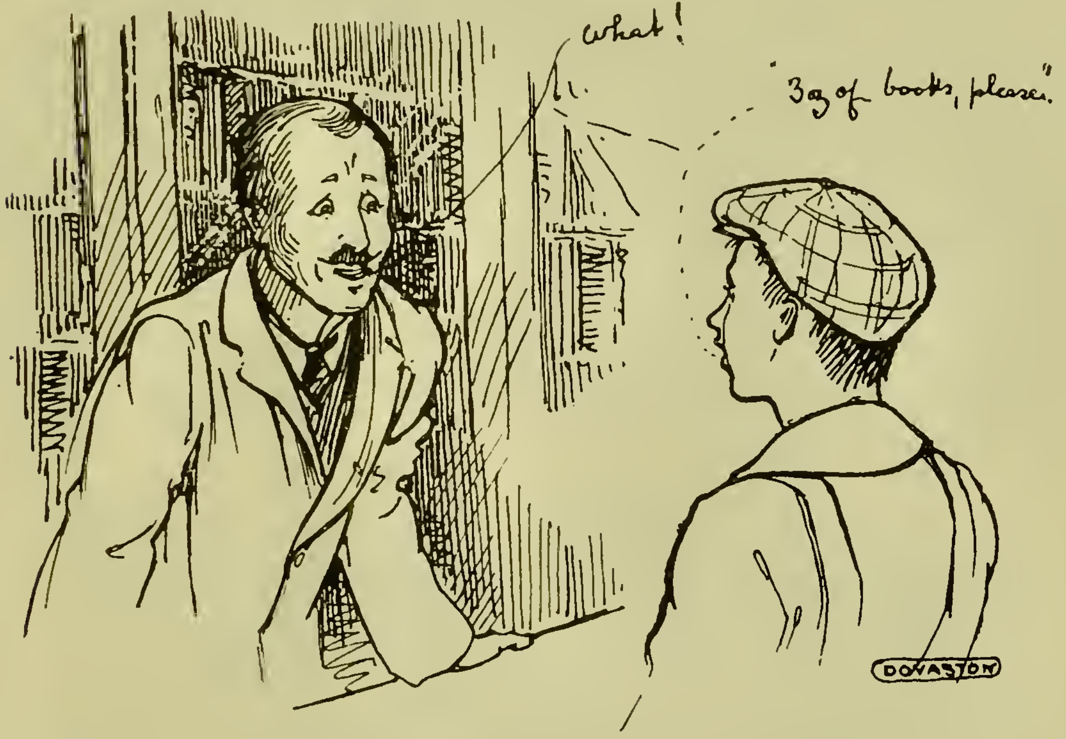

what!
"3oz of books, please."
DOVASTON

FIG. 21.—"WE DO NOT BUY BOOKS BY WEIGHT."

You see how astonished the bookseller is. No wonder! But it is not in the least more foolish of a man to buy books by weight without knowing what is in them, than it is of him to buy foods by weight without knowing what is in them.

Sensible people are also trying to find out how much food their bodies need. How much food do they need daily? Well, not long ago, learned men thought they could tell us just how much of each kind of food we needed daily; but lately we have altered our minds. Perhaps we need only half the amount which used to be thought necessary. People to-day are asking themselves not only what foods are best, but what amounts of different foods are best.

IV

COMPARISONS

YOU see this old castle? It was built nearly a thousand years ago by a nobleman who wanted to keep his family and his belongings safe from the attacks of wild Welshmen. He made the walls very thick and very strong. They were of

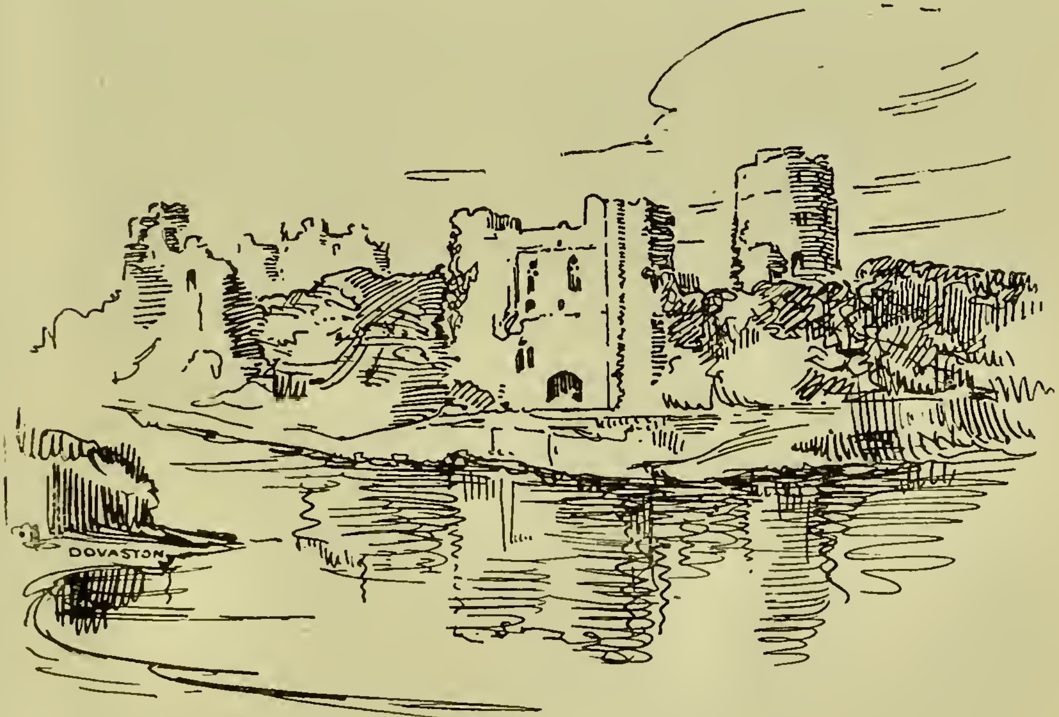


Fig. 22.—Pembroke Castle.

good materials, which were well put together; there was enough stones and mortar in them, and the stones and mortar were of the right sort.

The natives did not like the nobleman, because he was a stranger, and they often tried to get into the castle and steal the precious things it contained. But it was always able to keep them out. A big iron gate was shut down, the strong bridge was drawn up, water was poured into the moat round the castle, and no enemy could then injure anybody inside the walls. The soldiers inside could easily shoot their arrows through thin slits that did duty for windows, but their opponents who tried to shoot back found it very hard indeed to get an arrow through the little openings in the thick wall.

When the castle was about six hundred years old, a very clever attack on it was planned by Oliver Cromwell, whose statue is to be seen near the Houses of Parliament at Westminster.

For three months he hurled against it men and various weapons of war. He made no impression. Indeed, the old tower to-day—look at the drawing of it—is almost as strong and solid as it was then.

At last Cromwell took the building, not because it was weak or badly built, but because some one within it was a traitor, and showed him how to cut off supplies of water.

Without water the men within could not live, neither could they keep their moat filled. They had then to let Cromwell come and pull down as much as he could of the old place.

You have already seen the difference between a good house and a bad one. Refer to the houses on pages 15 and 16. Here in this old castle we see a building made of such sound material, so well put together, that, even after enduring a severe battering for three months, it did not give way. Sometimes you see a jerry-built shed (Fig. 23), which tumbles down almost of its own accord. In both cases the materials are chosen and put together by men. In the

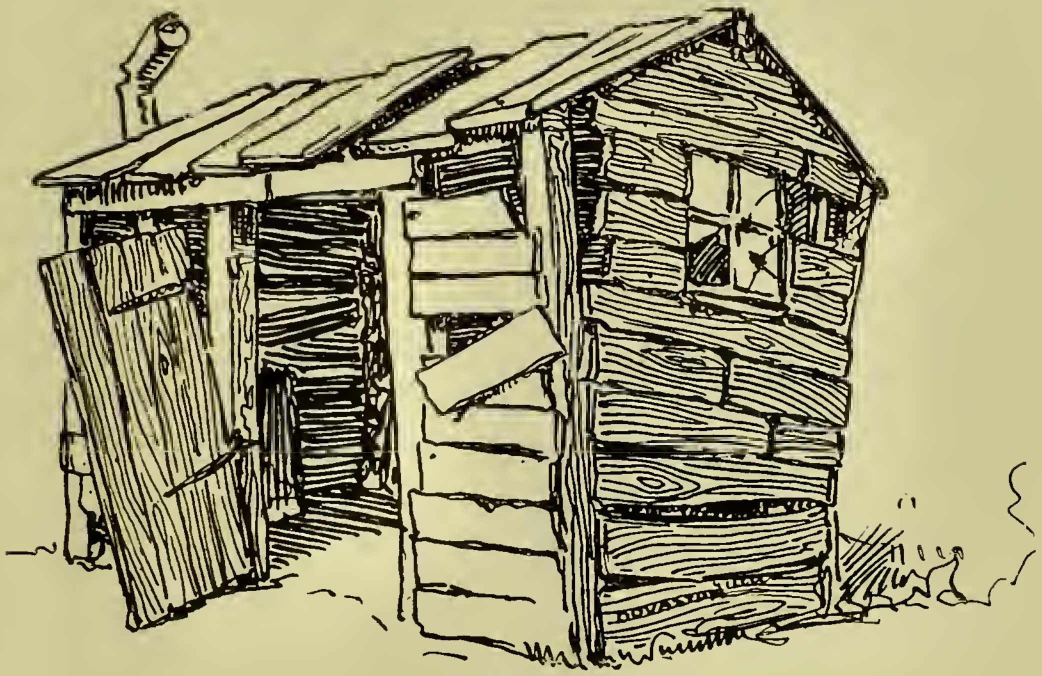


FIG. 23.—A JERRY-BUILT SHED.

one case men said they would build something that would last; they chose the right materials, and put them together rightly. In the other case, men did not trouble to build a thing that would last; they chose any materials that were at hand, and put them together anyhow.

The building was wanted for a short time and perhaps it was not worth much trouble.

Now you may look at these two buildings and ask yourself which you prefer to be like. I know very well which you will say. Nobody wants to fall to pieces and look like a ruin. Everybody wants to be strong and straight and good-looking as long as possible. What you must learn is this. Your body is to some extent what you make it. Use the wrong food, take it carelessly, and you must not expect it to look its best. Use good food, and take it wisely, because it will build your body—not just because you happen to like it. For instance, some people *like* tea and pickled lobster. They do not like fresh milk and nuts or good bread and butter. If they want to be as the castle is—straight and strong and beautiful in old age—they must give up tea and pickled lobster as their chief food, and learn to like what is good for them. It is certain that you can make your bodies stronger by choosing the right materials and putting them together rightly. You can make your bodies weaker and less long-lived by choosing the wrong materials and putting them together wrongly.

Not long ago everybody was shocked by the news that the roof of Charing Cross Station, one of the busiest stations in London, had suddenly fallen down. At first a terrible dread came to everybody, for it was thought that hundreds of people might have been crushed to death. Fortunately, however, it happened when only a few workmen were on the spot, and most of these escaped serious injury. When inquiry was made as to what had gone wrong, every one was surprised. An engineer who examined into the matter said that the accident was due not to the poorness of the material or to the age of the roof, but to the wrong way—the insecure way—in which the supports of the roof had been joined together at first.

As it is with buildings, so it is with bridges. Some bridges made of good stone or brick and carefully constructed, bear great strain. Others fall to pieces during the first heavy storm. So much depends on the material of which they are built, and the way in which it is put together.

Now let us take another comparison. Look at the fireplace once again (Fig. 3). Into it you put fuel, paper, wood, coals, and so on. You set light to this fuel, and the fire burns and gives out heat. By means of this heat, you could work a little engine, if you had the machinery ready. Your body is like that fireplace : it needs fuel to make the fire burn. When you decide to go for a walk, you are setting a match to your paper ; you are lighting your fire ; you are starting your engine working ; it will now work. But your body is not quite like the fireplace. That frame will last year after year ; when the fuel within it comes to an end, the fire goes out. Your body, when it has come to the end of its fuel, does not cease to burn fuel, but burns itself, its own tissues as fuel. Your body is a fireplace which, when it has used up all its paper and wood and coal, proceeds to use up itself also. You cannot altogether stop it from working ; it insists on working, and, in order to work, it eats up its own flesh.

Your body is very like a piece of machinery too. Keep it clean, and it will move smoothly and easily. Let it get dirty or rusty, because you are careless, or because you do not use it rightly, and it will work with great difficulty.

Or, to take quite a different comparison, look at the plants. How do they feed ? Partly by the roots, which take in something from the soil ; partly by the leaves, which take in something from the air—they take in air and light. They must have the right soil and the right air and light, or else they will not become perfect ; perhaps they will even die. Just as you must give a plant its right soil and air and light, so

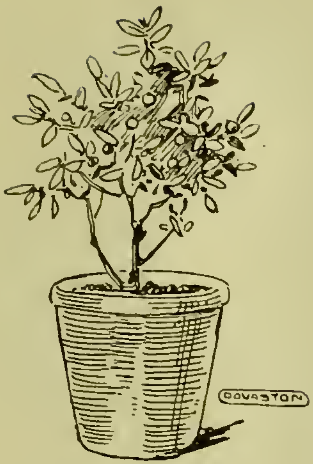
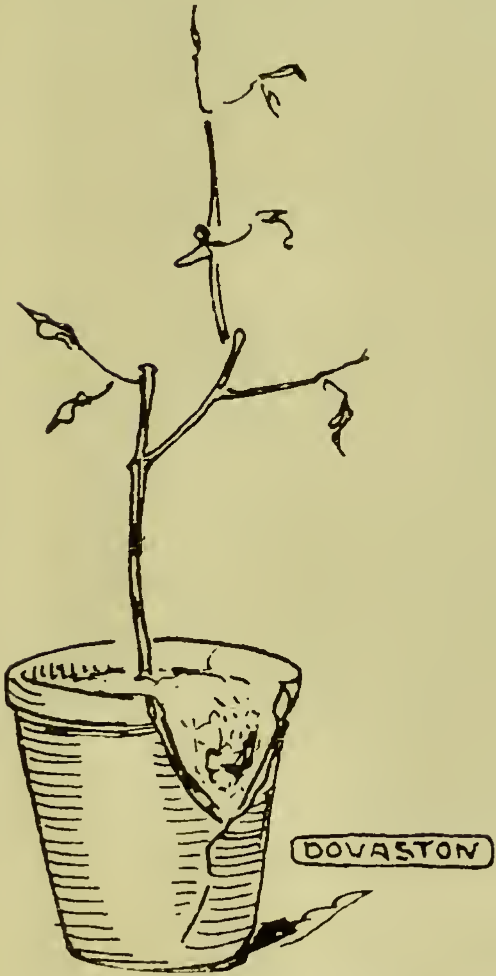


FIG. 24.—A HEALTHY PLANT.



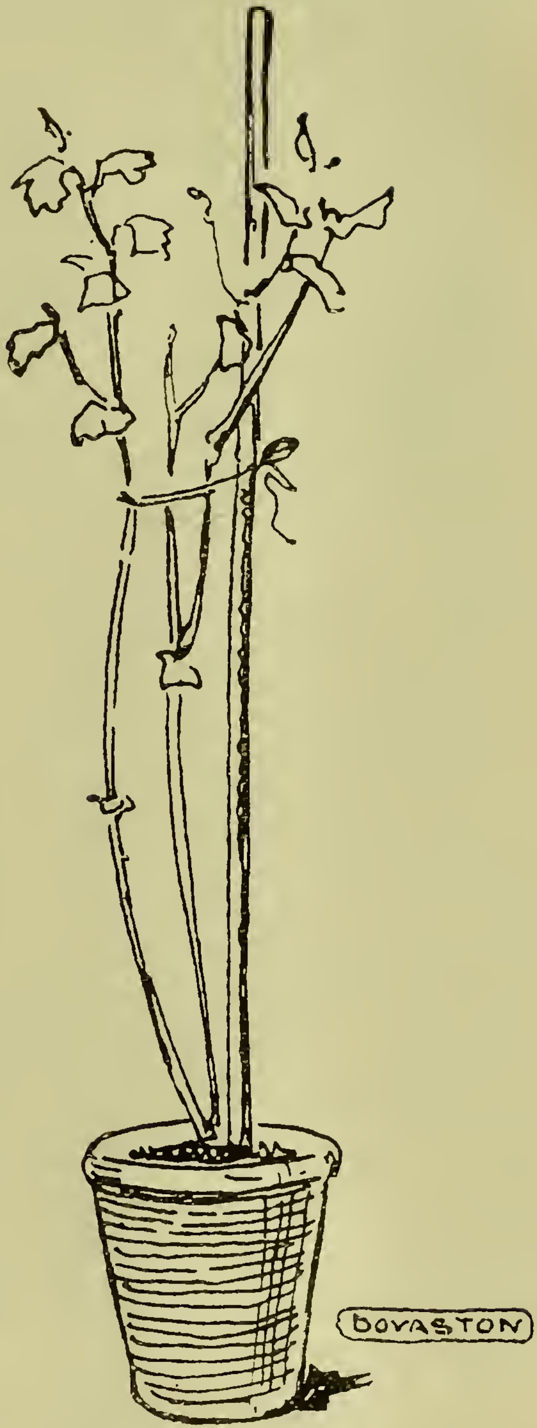


FIG. 25.—A NEGLECTED PLANT. FIG. 26.—A FORCED PLANT.

you must give your body the foods which are to it what the right soil and air and light are to the plant.

You cannot see the plant digest its food. What you can do is to put the food near and around the plant, and the plant will digest it in a marvellous way. So you cannot see yourself digest your food. What you can do is to get good food, and to chew it well.

When you eat the right food for building up your body, you are like the healthy plant that grows and flourishes. When you neglect your food, you are like the shrivelled and weakly plant. When you eat unwholesome food that pleases you but does not feed your body you are like the forced plant.

What is the right food ? you will ask. The purpose of this book is to make you able to answer that question. For the present we can say that the food should be attractive : it should taste nice, and you should attend to the flavour. The food should be of the right kind ; It should build your body, repair its waste, give energy, and so forth ; it should be absorbed, and so should be eaten in a leisurely way, and in meals not too close together. It should be put to some use, in the form of exercise of mind and body.

You eat and drink, and what you eat and drink goes into you. You read, and what you read goes into you. Some of your bodily and mental food is used to build you and give you power. Some is unused, and has to be removed ; so have the remains of what you have used. Some is harmful, poisonous ; you must get rid of that.

You now quite understand that your body is rather like a building, rather like a bridge, rather like a fireplace, rather like a plant, rather like your mind. It matters a great deal in all these cases what materials are used for building and repairing.

V

THE BODY-BUILDER, PROTEID

HOW is it that, when you cut a pencil, the pencil does not grow again, but, when you cut your nails and your hair, your nails and your hair do grow again ?

It is because your nails and your hair are made up of tiny living bodies called cells ; when the old cells die, new cells grow up in their place, the new cells being made from your blood, which blood is made chiefly from the food you have eaten and digested.

Our bodies are made up of millions of tiny bodies or cells, which are constantly perishing, and giving place to new cells that are like the old ones.

Suppose you no longer eat food, or, at any rate, no longer digest food ; what is likely to happen ? How will your body get new cells ?

First, it will use up its extra supplies, for it keeps a reserve in case of need. Then it will actually use up itself. It is made of cells, and it will use up the cells of which it is made: it will use up the cells as food.

It follows from this that you must give your body enough food to form new cells that shall take the place of the old ones, if you wish to avoid serious waste of your tissues.

On the other hand, you must not give your body too much of this body-building food. If you do, you will have to get rid of all beyond a certain amount, or else have your body clogged with what is useless and perhaps harmful.

The important point is that you should take just the right quantity: not too little, in which case you would have to live on your reserves and so destroy your own tissues; and not too much, in which case you would have to do needless work, and would probably feel uncomfortable as well.

This body-building material is called *albümen* (*albus* is the Latin for "white," and you know that the albumen of egg is white), or else proteid (*protos* is the Greek for "first," proteid being the first and foremost and most important element in our food). In this book I shall call it proteid: the Americans call it protein. Some writers call it "nitrogenous," because it contains nitrogen: but as this word "nitrogenous" has two distinct meanings, and as one kind of "nitrogenous" stuff is not body-building food at all, we had better avoid this word, and call the element proteid, the body-builder.

It is generally believed that, unless we have proteid in our food, we must die.

Many people, reading about this, have written to ask me where they can buy proteid to build their bodies. They cannot buy it all by itself. They can only buy foods that contain more or less of it, together with some other elements.

It is not the only food-element ; it is not the only necessary food-element. But it is thought to be the essential food-element, without which we cannot live for long.

Why have people eaten beef ? What good has beef done for them ? It has helped to build their bodies and repair waste. Is that all it has done ? No, it has supplied them with some fuel, for heat and power. It has even helped them to digest food. And it has done other things as well.

Is beef the only food that can do all this—build the body and repair waste, and supply some fuel ? No. Mutton and other meat, fish, and fowl also contain proteid. So do eggs. So does cheese. So do peas, beans, lentils. So do nuts. So do oatmeal and wheatmeal and many other foods.

Beef is not the only food that can build the body. I have not eaten beef for many years. I get some of my own body-building elements more comfortably from such meatless foods as cheese and beans.[1] But I am careful to have enough proteid. Merely because flesh-foods do not suit me, I do not neglect proteid. I have proteid, to build my body and repair its waste, not from flesh-foods, but from other sources instead.

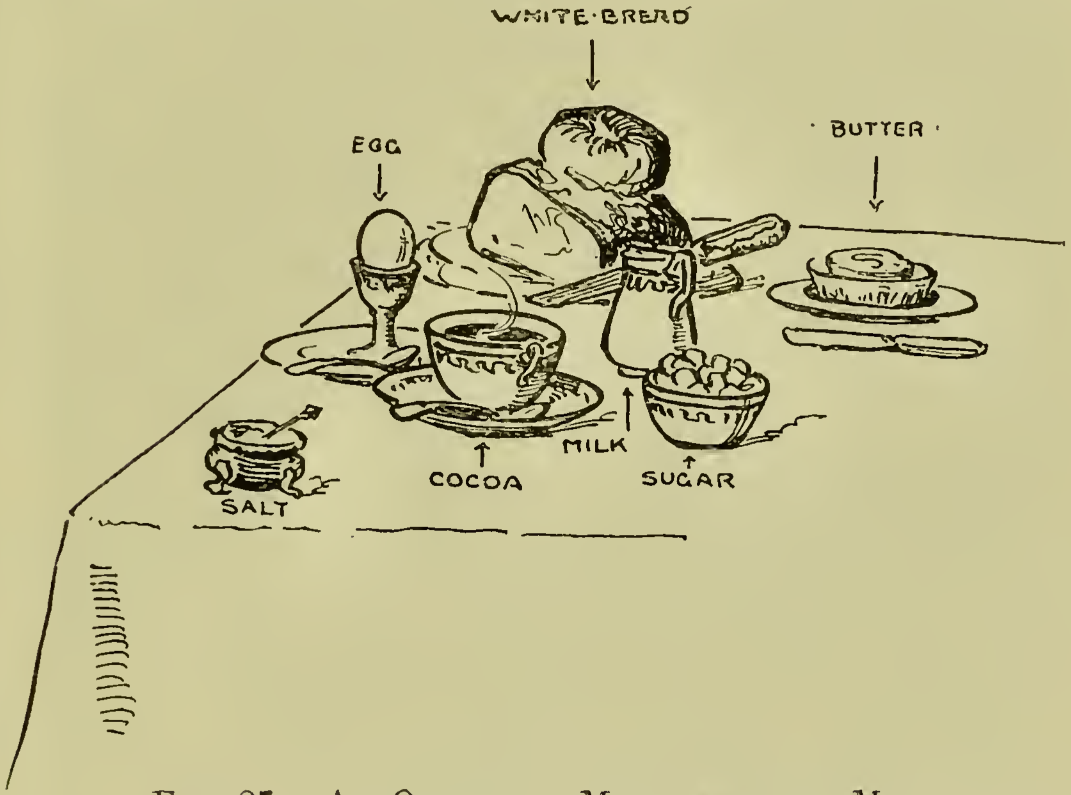


FIG. 27.—AN ORDINARY MEAL WITHOUT MEAT.

It is most important for people to know about proteid—what it does for us, what it alone can do for us, and which foods contain most of it: I mean, most of it in a form that we can digest.

---

[1] These are not my favourite bases.

For, suppose meat does not agree with some one, or suppose good meat costs too much money for him, what is there left for him to eat ? At the mid-day meal there will probably be a little white bread, which has a small amount of proteid in it, and some pudding, which also has a small amount of proteid in it ; then there will be pepper and salt, which have practically none at all ; and there will be cabbages and potatoes.

I have known many, many people who—for some reason or other—left off eating meat and ate only the things like the above, that were offered at an ordinary meal (Fig. 27). These, except for the egg, were poor in proteid. After a time, the people became pale and weak.

They had given up the body-building meat ; they had not—as I took great care to do, in my own case—found some other body-building foods, some other foods rich in proteid, instead of meat.

Nor is it enough merely to put into oneself foods rich in proteid. The food or foods must have the proteid in a form which the person, the individual, can digest and absorb.

I have known many people who left off eating meat, and took instead of meat some food which did contain proteid. But this food—for instance, a sort of porridge made from lentils, sloppy and almost tasteless—was indigestible, and not well absorbed. It made the people feel very uncomfortable and heavy at the time, and very empty and weak afterwards. Or else, perhaps, they ate nuts very fast, not biting the pieces well so as to break them up into a sort of pulp ready to be assimilated. The nuts had in them the body-building elements, or proteid, but this was about as useful to the body as clothes would be to a naked person if they were kept locked up in boxes.

Now, you are sure to ask, first of all, how much body-building material, what amounts of proteid, do such-and-such foods contain? Then, which foods are the best to eat? Which foods will give us their proteid in the most useful —and pleasant—form?

Well, as to amounts, you will find them on the chart. The answer to the second question you will find in the following chapter.

VI

WELL-KNOWN BODY-BUILDERS

WE have seen how important an element this body-builder, proteid, is. Dr. Robert Hutchison believes that a lack of proteid in food hurts us more than a lack of the other elements, and Professor Gamgee said, "Unless we have proteid we die."

Now we are going to answer the question—Which foods will give us proteid in the most useful form? Let us consider raw beef first of all.

Suppose one bought 100 oz. of raw beef, one would buy, in that beef, about 20 oz. of proteid: 20 parts in every 100 (or twenty per cent., as they say), 1 part in every 5, would be proteid: most of the rest, at least more than 70 parts (or seventy per cent.) would be water.

We can, then, give beef 20 marks, one for each part of proteid which beef contains in every hundred parts, thus:—

Beef (20) × × × × × × × × × ×/× × × × × × × × × × (Fig. 28).

Next take Cheddar Cheese. How many parts of proteid has this, in every hundred parts that

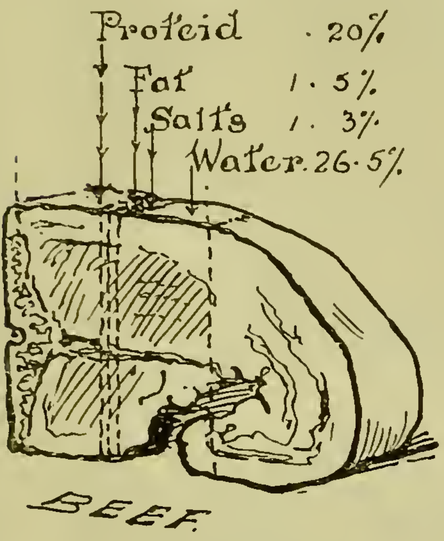


FIG. 28.—VALUE OF UNCOOKED BEEF.

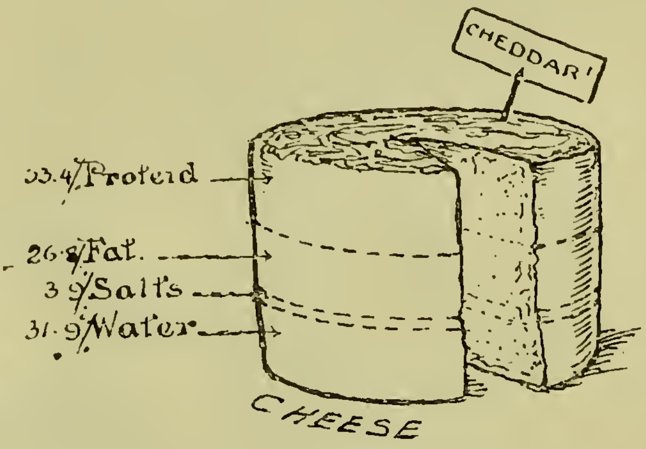

CHEDDAR!
33.4% Proteid
26·8% Fat.
3 9% Salts
31·9% Water.
CHEESE

FIG. 29.—VALUE OF CHEESE.

you buy? About 33. So we give Cheddar Cheese 33 marks, thus:—

Cheddar Cheese (33) × × × × × × × × × ×/× × × × × × × × × ×/× × × × × × × × × ×/× × × (Fig. 29).

FIG. 30.—VALUE OF UNCOOKED HARICOT BEANS.

Next take Haricot Beans, with 23 parts. Only remember that, before you eat these, you must have them soaked and cooked: they will then have taken up about their own weight of water (oatmeal can take up 5 or 6 times its own weight of water); and so the 100 parts of cooked Haricot Beans will only contain about 11½ parts of proteid.

Raw Haricot Beans (23) × × × × × × × × × ×/× × × × × × × × × ×/× × ×

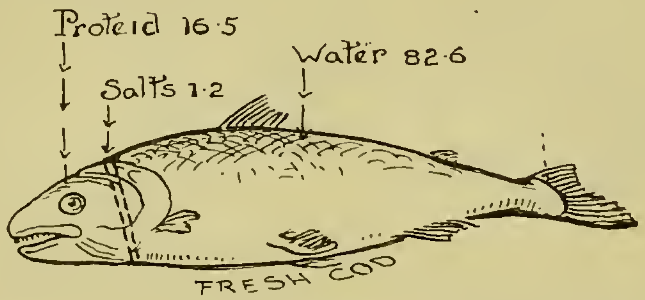


Fig. 31.—Value of an uncooked Fish.

Fish and Walnut (16) × × × × × × × × × × /× × × × × × (Figs. 31, 32). A fowl has the same (Fig. 33).

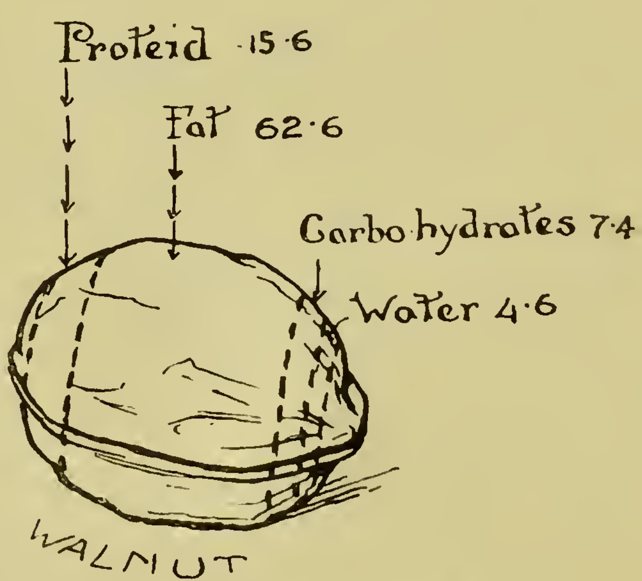


Fig. 32.—Value of a Walnut.

Egg has about 12 parts of proteid; Bread about 6; Cabbage about 4, Potato about 2; thus:—

Egg (12) × × × × × × × × × ×/× × (Fig. 34).

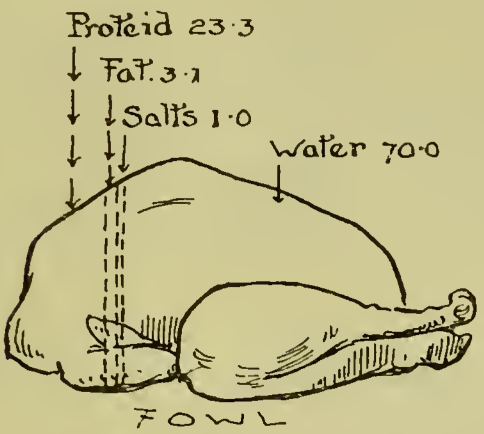


Fig. 33.—Value of an uncooked Fowl.

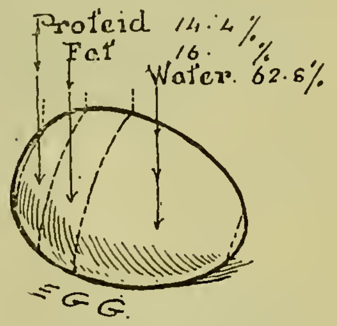


Fig. 34.

Value of an Egg.

Bread (6) × × × × × × (Fig. 35).

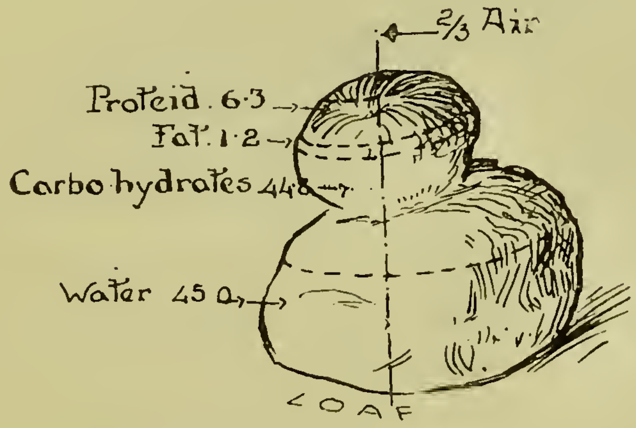


Fig. 35.—Value of a Loaf.

Cabbage (4) × × × × (Fig. 36).
Potato (2) × × (Fig. 37).

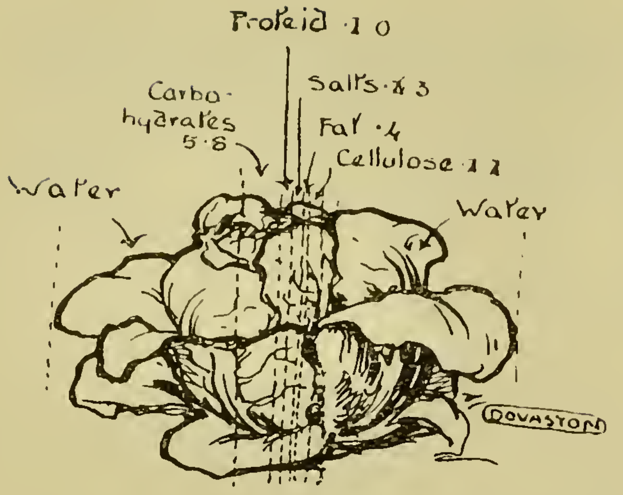


FIG. 36.—VALUE OF AN UNCOOKED CABBAGE.

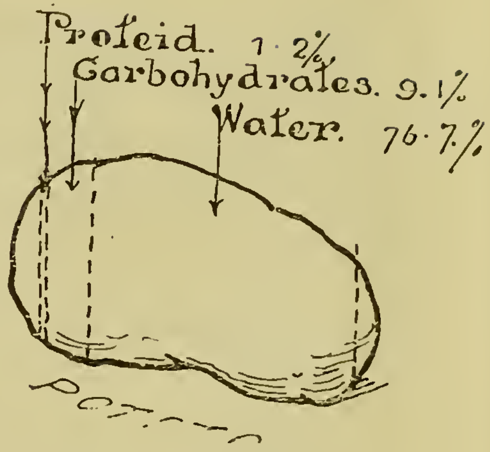


FIG. 37.

VALUE OF AN UNCOOKED POTATO.

Which is the best way of getting our body-building elements or proteid ?

As in learning, so in eating, the value of the food to mind or body depends largely on how much or how little is absorbed and used.

And it depends largely on another condition—how much or how little harm there is with the useful material. If, for instance, you had a perfect meal in other ways, but drank with it first some beer, then some strong tea, then some gin, the effects of all the things together would not be good. Now some foods have in them—at least for some people—elements that are very harmful, even while they may have quite enough proteid to build the body and repair its waste.

There are other conditions as well. We shall come to these directly. We shall then see that it is very hard to say which are the best sources of proteid for various people. So many different kinds seem to suit different people best.

Needless to say, the price is a matter to be taken into account. If I can get proteid from either of two sources, and if the proteid from these two sources seems to agree with me equally well and to build my body equally well, then I shall prefer the source that is the less expensive.

You will be able, now, to see the sources from which many people get most of their proteids at ordinary meals : namely, meat and fish, eggs, bread, biscuits, and porridge.

When you have mastered the chart, you will be able to see also which foods or drinks contain little proteid, or no proteid at all, and therefore are taken for some other reason. You will remember that sugar and butter, arrowroot, tea and coffee, beer and whiskey, contain little or no proteid.

Later on, you will know how much proteid and how much of the other elements there will be in bread, milk, jam, and many other articles of food.

Last of all, you will ask, " How much proteid does an ordinary person need daily, how many ounces ? And how could he get these—from what foods ? "

This question will be answered more fully in the following chapters. But *suppose* a man needed 3 oz. of proteid daily, and suppose he digested all sorts of foods equally well, and—though this is very unlikely—suppose he found no foods did him any harm at all, how could he get his 3 oz. of proteid, to build his body and repair its waste ?

If he got all his 3 oz. from only one food, which would probably be very unwise, he might take these amounts :—

About 8 oz. of milk-powder.

About 9 oz. of Cheddar cheese.

About 13 oz. of split peas, haricot beans, or lentils (all weighed when dry, not when soaked and cooked).

About 15 oz. of beef (weighed when raw).

About 25 oz. of eggs.

About 50 oz. of bread.

About 75 oz. of cabbages (weighed when raw).

About 150 oz. of potatoes (weighed when raw).

What if he took the wrong amount ?

Well, if he took too much, he would—as we have seen before—run the risk of clogging his body, perhaps of poisoning it. If he took too little, he would run the risk of starving his body, and losing weight by living on—and using up—his own cells and tissues.

This question of proteid, then, is a very vital one. We ought to learn as soon as possible which are likely to be the best sources of proteid for *us*—that is, which foods will build our bodies and repair waste; and which are likely to be the best amounts for *us*, according to our size and work and other conditions.

VII

WHAT CHOICE WE HAVE

WE have seen that the first and foremost element in our food-supply—the element without which we die—is the body-builder proteid. Other elements are important, but proteid is essential. Whence can we get proteid ?

You already understand that proteid can be got from many sources. In this chapter we shall see how great a variety there is.

First look at an ordinary English day's food : say a breakfast of tea, bread and butter, eggs and bacon ; a midday meal of beef and potatoes and cabbage, bread, and suet pudding ; an evening meal of tea, bread and butter, cold beef, cheese ; a cup of cocoa at night. Where is the proteid here ?

There is practically none in the tea, or butter, and very little in the potatoes, cabbage, suet, or cocoa ; there is a fair amount in the bread, more in the bacon, egg, beef, and cheese.

In those meals there is, as we shall see, a great deal of what is called stimulant—it does not build the body, but serves generally to make a person feel more comfortable, more energetic, just for the time. Tea is a stimulant, so is beer. Meat is a stimulant as well as a body-builder.

Now suppose you read somewhere or other that meat was bad for people, and so you left the meat out of these meals. You would then have the tea, bread and butter, eggs, beef, potatoes, cabbage, pudding, cheese, and cocoa. You would have taken away one of the chief body-builders, and would have put nothing in its place. That would be unwise, unless you took more bread, eggs, and cheese, or added some other body-

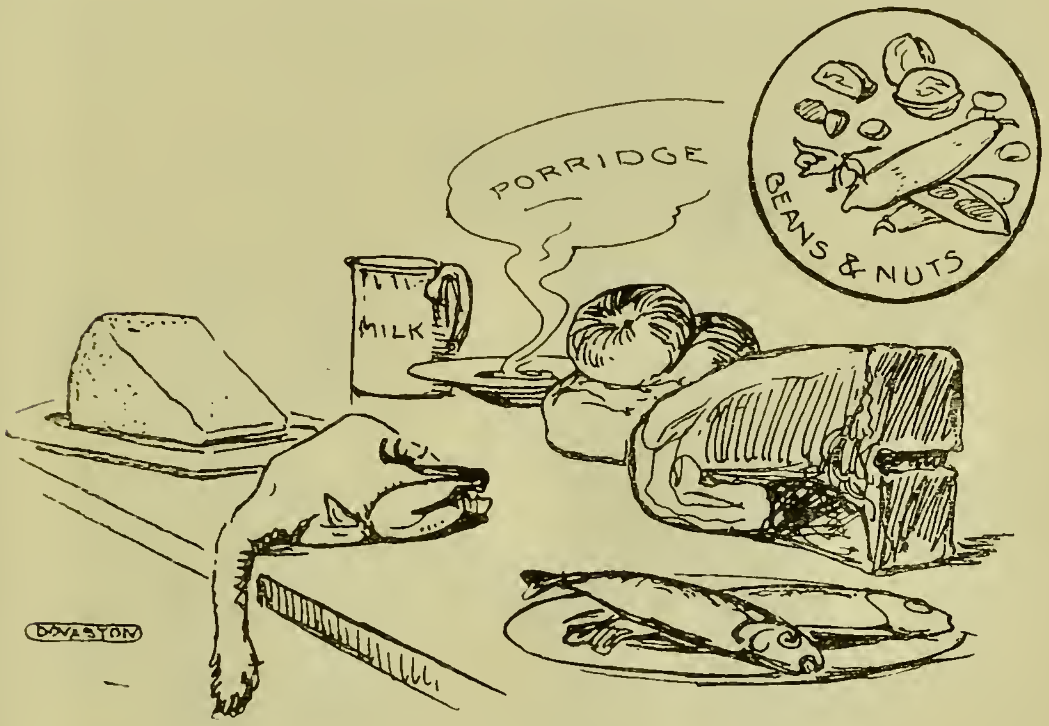


FIG. 38.—BODY-BUILDERS.[1]

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[1] Large quantities of milk and porridge are needed to give 3 oz. of proteid.

builder—what shall we say ?—well-cooked beans or lentils, split-peas, or nuts. Then, if you left out the tea, your meals would be body-building, and would not be so stimulating.

But it would not do to give up the meat and imagine that more potatoes and cabbage, more tea, would take the place of the meat : for these are hardly body-building at all. When I gave up meat, more than ten years ago, I took care to get in its place some body-building foods that suited. I chose split-peas, beans, lentils, cheese, milk-powder, and so on. Others find that eggs are good for them. Others seem to do better with figs, nuts, wholemeal bread, and so on.

Fig. 39.—Some Stimulants.

Let us see now how different are the foods—

and the sources of proteid—on which different peoples have done well. There is only room in this book to select a few instances—namely, some of the Persian soldiers (under Cyrus the Great), of the Jews of old, of the Egyptians, Hindus, Saracens, Greeks, Romans, Early English, Scotch, Irish, Japanese.

The Persian soldiers under Cyrus, a splendid army, flourished on bread, plant-foods, and water. Think of that! Cyrus himself had, besides, honey and raisins. The proteid came from the bread, a few of the plant-foods, and the raisins.

FIG. 40.—PERSIAN SOLDIER IN ANCIENT TIMES.

Some of the Jews of old had, for their body-building foods, bread and other grain-foods, and fresh or sour milk, lentils and beans (which are very rich in proteid), dried raisins and figs, and certain flesh-foods on special occasions—but the flesh of many animals was forbidden. Besides, they had leeks, onions, garlic, fruit, olives, oil, honey, and wine.

Out in the desert of Egypt there are great buildings that were made long ago, marking the burial places of kings. It is supposed that the raising of the Great Pyramid, which is 460 feet high, must have employed 100,000 men for twenty years. The carrying of stones and placing them together in such a way as to be firm and lasting needed great strength.

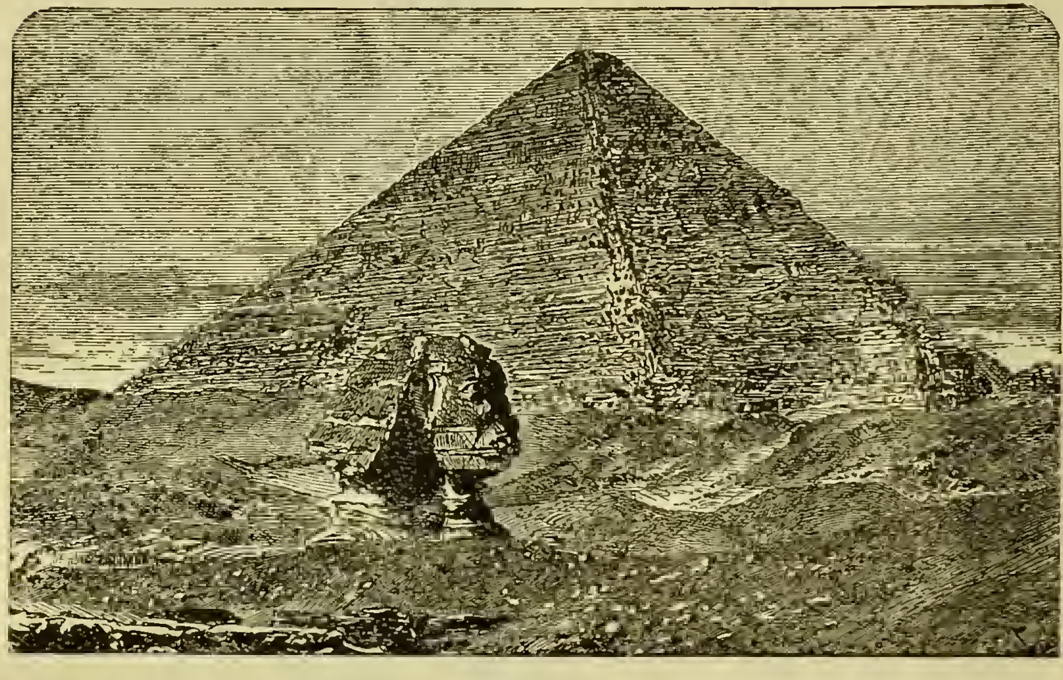

FIG. 41.—THE GREAT PYRAMID AND SPHINX.

It is said that the Egyptians who built the

Pyramids got their proteid mainly from lentils, and had leeks or onions as well. The Egyptians of Upper Egypt got their proteid mainly from bread, fish, and birds.

FIG. 42.—SARACEN AND CRUSADER.

Many of the Hindus get theirs from lentils and rice.

The Saracens got theirs from milk and rice. They also ate fruits.

You have read in your English History how strong the Saracens showed themselves to be when they fought with Europeans for the possession of the Holy Sepulchre during the Crusades.

Some of the Greeks lived on barley—for instance, barley-porridge or barley-bread (or flat pancake), figs, cheese, beans, and occasionally fish, and black-pudding, as their body-builders. They ate olives, honey, herbs, and cabbages, as well. Plato, the great philosopher, said that the best diet for ordinary people was barley-broth, cheese, olives, etc.

The Romans—like these Greeks—at first had only two meals a day ; but afterwards they had more meals and more varied, more luxurious, more stimulating foods. The Roman soldiers fared well on wheat (as porridge or as bread), pulses (beans, etc.), milk, cheese, vegetables, and fruits. Flesh-foods were chiefly used as a relish or a holiday-luxury.

What did the English in early times thrive on ? For we owe much of our greatness to them, and it is interesting to know how they built their bodies.

They got their proteid from white and black bread, milk, cheese, bacon, eggs ; later on, they also had potatoes and green vegetables. As a rule, until a hundred years ago, the labouring classes did not eat much meat. Some English in the North at one time thrived on oatcake, hasty-pudding, and water.

Fig. 43.—Early English Peasant.

It is interesting to read what Stubbs wrote in 1583, in a book on *Anatomy of Abuses* :—

"Yea, the most of them (our forefathers) fed upon graine, corne, roots, pulse, hearbes, weedes, and such other baggage; and yet lived longer than we, were healthfuller than we, of better complexion than we, and much stronger than we in every respect. . . . Do we not see the poor man, that eateth browne bread (whereof some is made of rye, barley, peas, beans, oats, and such other gross grains), and drinketh small drink, yea, sometimes water, feedeth upon milk, butter, and cheese (I say), doe we not see such a one healthfuller, stronger, fairer complexioned, and longer-living than the others that fare daintily every day?”

Fig. 44.—Scotch Peasant.

Most of the Scotch and Irish did capital work on grain-foods, vegetables, potatoes (which also suited the Cornish miners well), and milk or butter-milk, with flesh-foods only occasionally.

But, during the last hundred years, things have changed. More people can afford to buy expensive and stimulating foods like meat, and things which are stimulating but are not body-building (such as tea, coffee, alcohol, tobacco). Instead of home-made bread, cheese, milk or butter-milk, and simple things, we find among all classes a free use of baker’s bread, flesh-foods, ginger-beer and mineral waters, cocoa, chocolate, sweets and jams, cakes and pastries, eggs, and chemicals.

The Irish, for instance, who used to live on potatoes, milk, and whiskey (which is not body-building), now continue the whiskey, but live much more on flesh-foods, tinned foods, and tea. In Scotland, again, you do not often find to-day the well-cooked oatmeal porridge on which the Scotch of old flourished.

The last picture (Fig. 47) you will see at once to be one of a Japanese soldier. Lately everybody has been talking about the bravery and cleverness of the Japs, as they are called. They held their own against the Russians,

Fig. 45.—Irish Peasant.

and they have made very wonderful laws for themselves. We English are glad to call them our allies. Well, the Japs build up their bodies and keep them very nimble and healthy on fish, eggs, beans (all rich in body-building elements), rice, millet, etc., as well as green vegetables and herbs. The Japanese drink a great deal of tea, poured quickly off the leaves, not left to soak and stew as in some English houses—a very bad plan.

Fig. 46.—Cornish Miner.

It would be easy to go on, page after page, telling you of the different sources from which different peoples get their proteid: how the Laplanders get theirs from flesh-foods, while the Finns, in an equally cold climate, get theirs chiefly from grain-foods, and live quite merrily.

But you will be wanting to know, first of all, why different peoples get their proteid from different sources; and then, which are the best sources for you and me. This you will learn in the next chapter.

Fig. 47.—Japanese Soldier.

VIII

HOW TO CHOOSE WISELY

WHY are different sources chosen? Partly, of course, because different foods are cultivated in different countries. In hot countries you find bananas and grapes growing naturally, in cold countries you do not.

Then, again, there is the expense. In Italy the common people cannot afford much flesh-food—they live largely on macaroni.

Then there is the age of the person. A baby thrives on pure milk; a grown-up man can eat and drink many foods that would soon kill a baby.

Then there is the question of which food the person—and his father and mother—have been used to. If you are used to take this or that, you will naturally go on taking it.

And, again, when you are living in a hot country, you will not need just the same sort of food as when you are living in a cold country; the blubber which seems to suit the Laplander among his snows will not suit the Arab (Fig. 48), in his hot desert region.

And there is the question of exercise. The labourer working in the fields or on the road, exposed to all weathers, will not require (Fig. 50) quite the same food as the bus driver (Fig. 51), who is sitting on his box for much of the day, yet is using his arms, and is having plenty of fresh air. And neither of these will require quite the same food as the clerk who is sitting on his chair

Fig. 48.—An Arab.

or stool for much of the day, but is getting little exercise and little fresh air, and is using his brain (Fig. 52).

And—last but not least—there is the question of what is offered to the person. A man may want this or that; but, to save trouble, he will often take just what is put before him, even if he thinks it is not good for him.

FIG. 49.—A LAPLANDER.

For all these and many other reasons, different persons get their proteid from different sources. Some get too much, some too little; and some get their proteid from the wrong sources.

And most people tend to take, besides their proteid and other elements that they really need, a great deal that they do not really need—and especially a great deal that stimulates them or over-fills them. They take far too much alcohol, strong tea, and so on.

Coming, then, to the second question: Which are the best sources of proteid? we can say at once that the best sources are, as a rule, the purest; those which stimulate us least, and over-fill us least, especially if we are already highly-strung and over-filled or clogged in our bodies.

Here is a good example. In New York I saw a young American — he was only twenty-five years of age—who had a hurrying, worrying nature. He was what is called highly-strung; very quick, very fidgety, very irritable. He took scarcely any exercise, which might have worked off his nervousness. He was living in a very dry climate—the air itself seemed to make people nervous. Now what sources ought he to have chosen for his proteid?

Fig. 50.—Labourer at Work.

You will say, at once, sources that would not make him more nervous, more highly-strung, than he was before. Quite so. But what sources did he actually choose?

Not only did he take plenty of stimulants—tea, coffee, alcohol, etc.; he also took flesh-foods, irritating sauces and condiments, as well as other rich foods, which made him even more nervous than before.

Besides, he ate and drank terribly fast. He scarcely masticated his food at all, but washed it down with lots of drink.

What would have been the right sources for him?

He could have found out by *experimenting*; by trying other sources fairly, and seeing whether they did not suit him better. He might have tried such body-building foods as milk-powder (added to various foods), or cheese, or eggs, or something else.

At present we cannot safely say that any *one* source of proteid is the very best. What we can say is that some sources of proteid are clearly wrong for some people, while they may be right (or not nearly so wrong) for other people.

As an instance, I know that there are three sources of proteid which are wrong for *me* (though they may not be wrong, or may not be so wrong, for you and others): they are flesh-foods and meat extracts, eggs served as eggs (perhaps these will agree very well with you), and oatmeal (of which the same can be said). I know this for a fact, because of hundreds of personal trials.

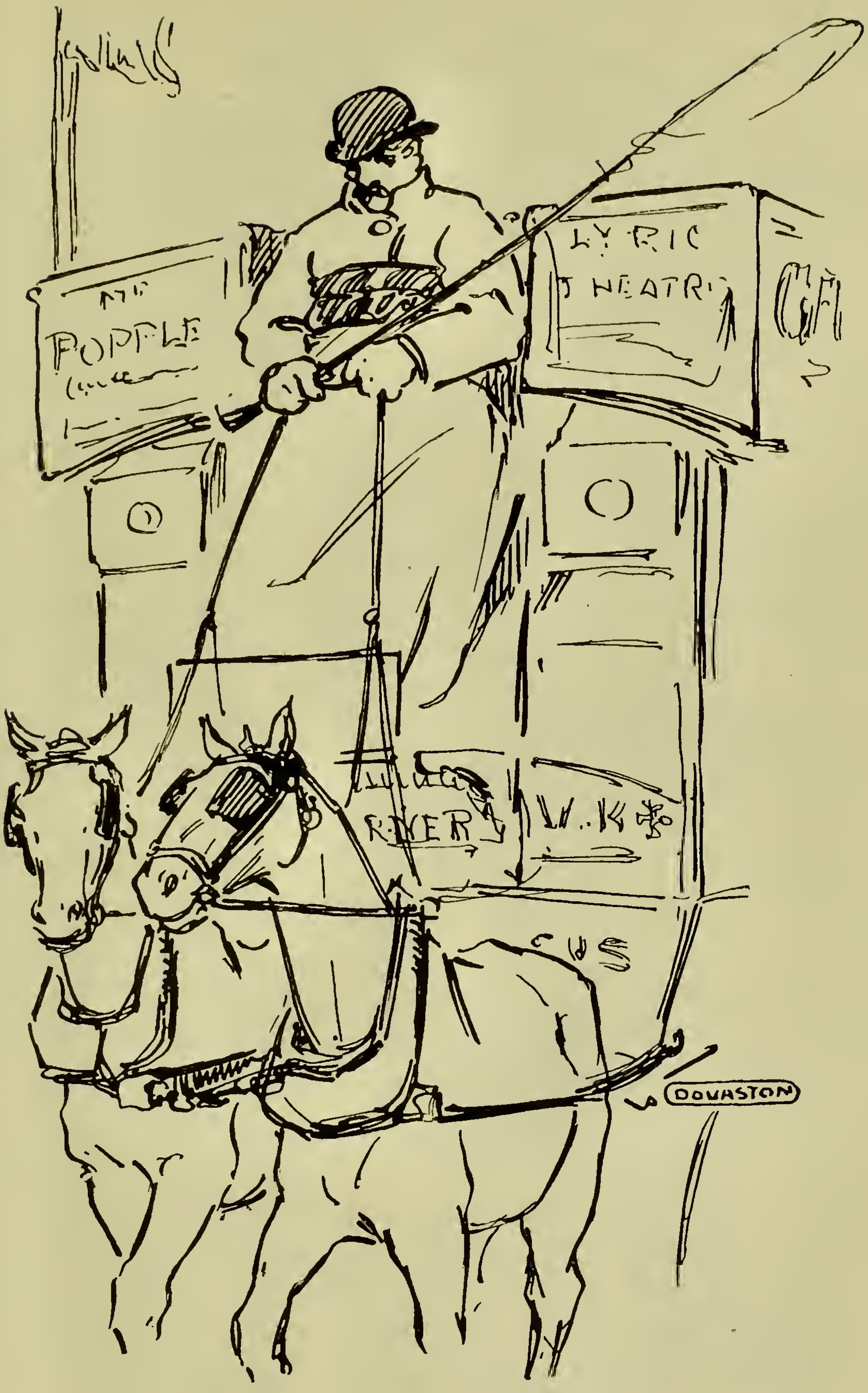

FIG. 51.—A BUS DRIVER.

On the other hand, I have found that the pulses (peas, beans, lentils) when properly cooked, and cheese, and milk-powder, are splendid sources of proteid for me. I know this also as a fact, because of hundreds of personal trials.

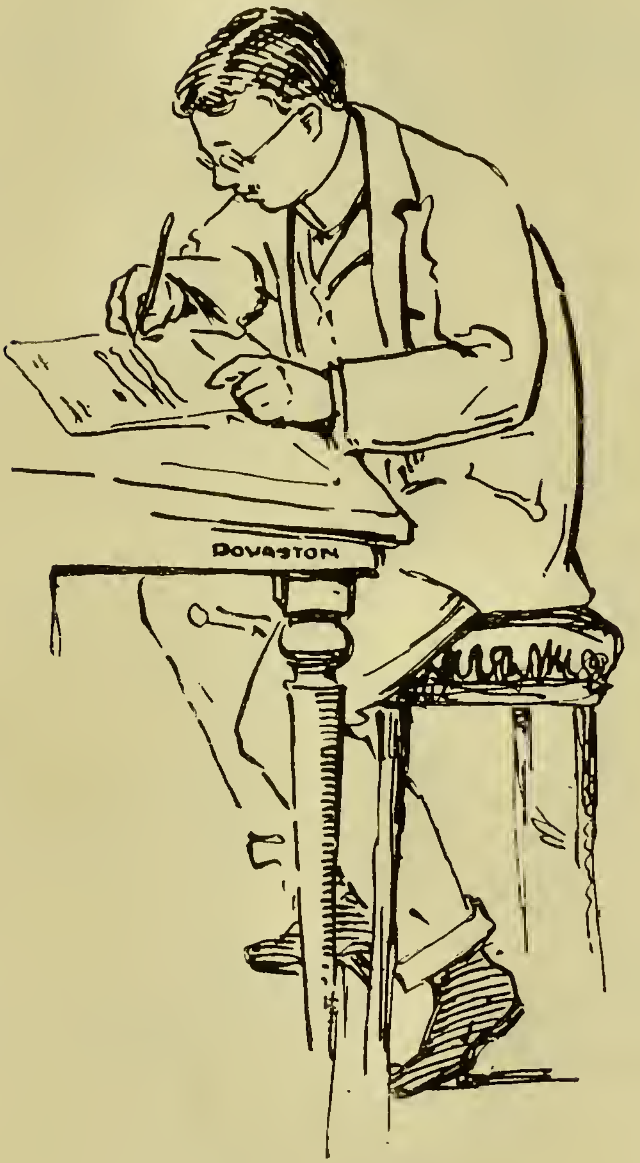

Fig. 52.—A Clerk.

But I know also very many people who are *not* suited by the pulses at all; others who are not suited by cheese; and a few who are not suited by milk-powder.

And, again, I know very many people who are not suited by beans prepared and cooked in the ordinary way, but are suited by beans prepared in my way.

So you see it is a very difficult matter, this matter of proteid. And yet an essential matter.

Is there nothing that we can say for certain ?

Yes, I think there is something.

First of all, learn what *are* the sources of proteid. You can do this by studying this book, and especially the chart and tables of proteid-values.

Then learn what are stimulants and irritants (for instance, tea, coffee, and beer), and avoid these as far as you can without offending people.

If you cannot easily avoid something that disagrees with you, eat very little of it extra leisurely; masticate it even more thoroughly than usual. Then it will do you less harm. And keep cheerful and good-tempered.

Whenever you have the chance, choose the purest sources of proteid, those that are freest from stimulants and irritants. For instance, pure milk, good bread, and nuts, are among the purest sources and the best, if you do not eat them too fast.

Do not over-eat: especially, do not go on eating when you are no longer hungry, but are merely greedy—that is, do not go on eating when you have had enough nourishing foods but enjoy the flavours. It is not greedy to enjoy food: it is only greedy to eat food or sweets when you are satisfied but like to go on tasting the things. For instance, during holidays people often eat and drink far too much of foods that do not feed them; they go on eating and drinking all sorts of luxuries, without control. This is a great mistake.

If you must take a certain amount of things that will hurt you, take as little as possible. Get enough nourishment in as pleasant a form as you can. But try to avoid the stimulant—and especially the stimulant, like strong tea, that does not nourish at all. Alcohol is far from being the only stimulant.

We have now found some of the different sources of proteid or body-building elements: among these sources are, as you see in the chart, flesh-foods (but not flesh-extracts), animal foods (eggs, milk, and milk-products, such as cheese, but not butter), and grain or cereal and other plant-foods (of which the highest body-building values are in the pulses, nuts, and oatmeal and wheatmeal, the lowest in the green vegetables, roots, and fresh fruits). We must next consider how much proteid we need daily.

IX

HOW MUCH PROTEID WE NEED DAILY

IN the last chapter we saw how very different are the sources from which various persons have obtained their proteid. While many obtain theirs from meat, bread, and eggs, others never touch these things but live entirely on nuts and dried or fresh fruits, while others live on scarcely cooked meat and fish and plenty of hot water. And we saw a few of the reasons why different sources of proteid were chosen by different people.

In this chapter we are going to consider the amount of proteid needed by different people.

Naturally, as the sources of proteid vary, so the amounts vary too.

And, as we do not yet know exactly which are the best sources for all people, till there have been fair trials made by the people themselves, so we do not know exactly which are the right amounts for all people.

The right amount depends on a large number of different conditions.

Think of the engine once again. How much fuel does an engine need? You cannot tell till you know the size of the engine, the amount of work it has to do, the pace at which it does that work, the cleanness of the engine, and so on.

FIG. 53.—A RUNNER.

There have been cases in which an engine has been given far too much fuel, including the wrong sort of fuel, day after day. Then some one has tried the plan of giving it less fuel, but fuel of a better kind; and the engine has worked better and far more cheaply. Sometimes the cleaning of an engine has made it work well, when the only way that had been tried before, the way of using more and more fuel, had altogether failed, and, besides, had cost a great deal of money.

Now suppose you had an engine which you wanted to run hard for all the twelve hours of all the week-days, but which you wanted to rest on the Sunday. Would you give it just the same amount of fuel on the Sunday as on the week-days? Of course not!

Fig. 54.—A Child of Seven needs 1,750 Calories daily (Atwater).

And suppose there came a whole month during which you wanted it to run say for scarcely half-an-hour. Would you give it just the same amount of fuel as before? Of course not.

Now think again of the life that most people used to lead and of the life that they lead to-day.

They used to be out in the country, taking plenty of hard exercise with their bodies, in the farms or fields ; to-day where are they and what are they doing? They are in buildings, offices, factories, etc., sitting down, taking scarcely any exercise with their bodies, but plenty of exercise with their brains. So far as their bodies are concerned, they are like the engine that only had to run for an hour a day.

Fig. 55.—A Boy of Twelve may need 2,800 Calories daily (Atwater).

These people, then, will they need more body-building elements, or less, in their present life? Clearly, less.

But still they need *some* proteid. For even while they are sitting they are using muscles. And, if they are worrying, they are breaking down some of their tissues. Have you not noticed how thin most people become when they worry? They need *some* proteid. But not as much as the navvy when at work, not as much as runners or walkers or other athletes. (Figs. 53, 56.)

The right amount of proteid, then, depends partly on the work, especially the bodily work, that is to be done by the person, as well as upon the size of the person.

It is generally said that, however much pro-

FIG. 56.
A NAVVY MAY NEED 4,500 CALORIES DAILY (ATWATER) WHEN DOING HARD WORK.

teid an ordinary person may need, a child of seven will need about half that amount.

But to-day many of the professors are gradually changing their minds. Nearly 350 years ago, Cornaro, an Italian nobleman, who was very ill at the age of 40, began to take very much less than half $4\frac{1}{2}$ oz. of proteid daily, and became so healthy that he lived to the age of 98. He chose a far purer diet than he had had before. He might have chosen a still better one, but as a matter of fact he now lived on bread, meat, soup, wine, and the yolk of egg.

Again, quite recently, Mr. Horace Fletcher, an American, lived for years on less than half the $4\frac{1}{2}$ oz. of proteid : he says this was because he masticated all his food very thoroughly, chewing it so long as it had any taste at all. When I saw him he looked well, and was able to cycle, skate, etc., in spite of his age and in spite of the fact that, years before, he had been refused by an insurance office because he was not healthy.

Professor Chittenden, another American, was so interested in this that he made experiments with soldiers and athletes and others, and found that they did good physical work, in fact, better physical work than before, not on $4\frac{1}{2}$ oz. of proteid, but on very much less than half that amount. Professor Chittenden himself lived for some time on less than a third of that amount.

X

UNITS OF ENERGY

WHAT does fuel do? It gives warmth, and this means more than mere comfort. It means power, as you will see directly you notice how the fuel in a steam engine can make the steam engine travel and pull after it a vast weight of carriages.

We are rather like engines. We certainly need fuel of our sort, with which to enable our machinery to work.

Our machinery, we have seen, is largely made up of the body-building element, or proteid. And Sir Michael Foster thought that we might live on proteid alone; that it would not only build us and repair our tissues, but would also give us fuel for warmth and power. But it would be, he said, an expensive food, because we can get our fuel more cheaply from other sources.

While a man might live on proteid alone, he could not live on oil and other fuel-givers alone; he must have body-building and tissue-repairing elements.

Fuel, then, is very important in our diet, though not the most important part of it.

How can we get fuel, as well as from proteid? There are three chief sources. In a piece of bread and butter, with a little jam on it, you have all the three sources. The butter you can call oil or fat; part of the jam you can call sugar; the bread, though it contains other things as well, you can call starch. Butter is almost entirely oil or fat. Potato is almost entirely starch and water. Some foods, then, are almost entirely fuel. Sugar is entirely fuel.

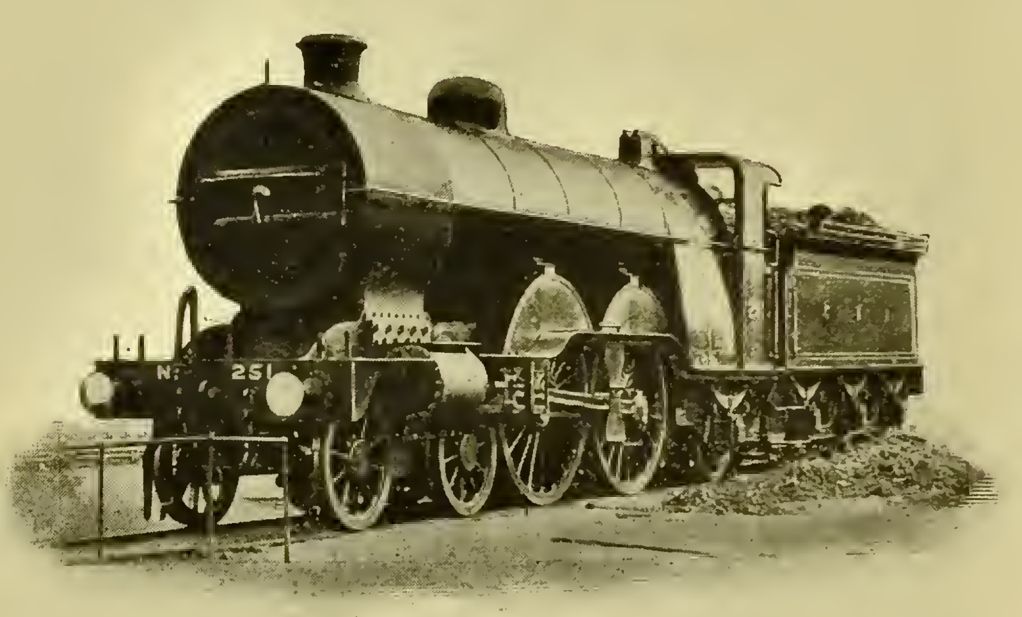

Fig. 57.—Engine with Tender.

These fuels may be "filling": they may give you a sense of having eaten something, and that is in their favour.

On the other hand, some of them may be

clogging, and they are not a complete food. Many forms of fuel are very poor in proteid and "salts." Pastry, arrowroot and other starchy foods, as well as sugar itself, are very poor in proteid and "salts."

Fig. 58.—Loaf of Bread.

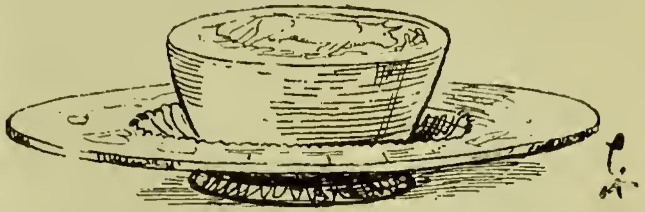

Fig. 59.—Pat of Butter.

Fig. 60.—Sweeteners.
Fuel Foods.

Besides this, too much starchy and sugary fuel may lead to fermentation. The stomach may become like a bottle of beer; you know how that bubbles and effervesces. (Fig. 61.) Perhaps you know what your stomach feels like when you have eaten too much, and have eaten too fast. It feels uncomfortable. That is generally because food in it is fermenting.

The fuel, then, should not be of a kind to ferment too much. It should be of a kind easily digested and assimilated. It should be of the right amount, and should not have the wrong things added to it. It should not be piled in all at once, for you know that even a fire burns better when the coals are put on it by degrees, instead of in a great mass.

FIG. 61.
BOTTLE OF BEER.

Is there any difference between oil, starch, and sugar? They are all fuels; they will all burn in the fire; they will all burn in the body. Will they burn in the same way?

No. Oil seems to burn most slowly: it spreads itself out over the longest time.

Then comes starch: it spreads itself over a fairly long time.

Last comes sugar, which spreads itself over a very little time. It seems to be burnt up more quickly than starch, and far more quickly than oil.

Different kinds of fuel suit different people and different purposes. Personally, for instance, I do not care for such sugar as is bought in shops. But butter agrees with me very well. So does nut-butter. I know others who do not like butter, but they can eat a great deal of starchy and sugary food, and they seem to be well on it.

Now recall once more what the oils and starches and sugars do for us. They do not build our bodies and repair the waste; they only give energy, as fuel gives the engine power to move. In the first place, they save proteid. If you get your fuel from oil or starch or sugar of a good kind, you do not have to use up your proteid as fuel. The man with valuable books in his room does not use up those books to make a fire: he uses coal, which is much cheaper. So he does not use proteid to give himself heat: he uses oil or starch or sugar, which are usually much cheaper.

These fuels give fat to cover the nerves. How many people are nervous because they are thin. It seems as if their nerves were badly covered and were hurt by being exposed.

Then the fuels supply heat and give energy for work, as in the case of the engine.

Perhaps oil does something more; perhaps it makes the system work more smoothly. We do not know exactly what oil does, but it may be what is called a lubricator, making the joints work more easily. You have often seen men oiling the wheels of carriages to make them run nicely.

The value of food as fuel is often explained in this way:

There is needed a certain amount of heat to make water warmer. Suppose you had about 35 oz. of water (or 1,000 kilogrammes, as they are called), and you had enough fuel to make that water 1° (Centigrade) warmer than it was before, then that amount of fuel is called a calorie: the word is from the Latin word *calor*, which means "heat." According to English measures, a calorie will raise 1 lb. of water 4° Fahrenheit. If a food is able to give so much heat and energy, we say that it contains so many calories.

Dr. Robert Hutchison thinks that our food every day ought to have in it over 3,000 calories. (But Professor Chittenden thinks that it needs to have in it less than half that amount.)

XI

FOODS THAT FEED AND CLEANSE

SOME elements seem to satisfy us, but do not really feed us. For instance, if we took a great deal of water, or some arrowroot, we might feel full, and yet not have eaten body-building elements. So, after a cup of tea, people may cease to feel hunger, and yet not have swallowed anything to repair their waste.

What will satisfy us, and at the same time build our bodies, and, generally, serve as true food ?

For when we have had a meal we like to feel satisfied. We do not like to leave off with a feeling of emptiness, even if we know that after half an hour this feeling will pass away. How can we get the feeling, not of overfulness, but of comfortable satisfaction ?

Proteid, the body-builder, will help to give us that feeling. As we have seen, we can get our proteid from meat or other flesh-foods, from eggs, from cheese, as well as from haricot beans, nuts, and so forth, so long as we digest these things.

Then there is milk. If you ate a few handfuls of sawdust you would feel full. There would be in it very little proteid ready for use; it would fill you by its bulk and weight.

It would fill you also by its fibre. There would be in it a great deal of indigestible stuff, shreds.

If you took it with a little water, it would fill you, thanks to the water. Hungry people could satisfy their hunger for a time by drinking.

Bulk, fibre, water, together with all true foods, have their use in satisfying us. What satisfies us best?

For my own part, I find that I feel most comfortable when I take my meals at the right times: when I eat not between meals, but simply at mealtimes, and eat the right things.

I find myself satisfied much sooner when my body is in good health; when my blood and my whole system is clean: that is to say, when I have been feeding rightly. When I have been feeding wrongly I seem to need much more food before I feel full; I seem to have an almost aching desire for more material.

How can this be? How can we feel empty when we are full? Too much food may ferment and produce gases that make us uncomfortable, and give us the idea that we are empty. This is not a healthy hunger; we are not really empty, we are only uncomfortable.

So the right thing to do in order to get the feeling of satisfaction is not simply to eat a very great deal. It may be to eat even less than usual, and so avoid this fermentation. After a few days we may find that we are no longer ravenous ; a very little of the right food will satisfy us.

Fig. 62.—Portrait of Mr. Eustace Miles.

Satisfaction, then, does not depend simply on the amount of proteid or fuel, or on the bulk or on the fibre or on the water, but partly on a good state of health, a freedom from what clogs our machinery.

Needless to say, it depends partly on the choice of foods that will be well digested and build us, and repair our waste, and give us material for fuel and heat and energy.

Some foods are clean in themselves. Wheat is usually a clean food, though it may have in it some irritating particles. Fresh and dried fruits, and fresh vegetables and salads, though not rich in body-building elements, are usually clean foods. Milk-powder is a clean food, rich in body-building elements, and very cheap.

If we chose clean foods, and did not take too much of them, we should not need so much cleansing.

But most people clog themselves by taking too much food, or by taking (perhaps with clean foods) such " extras " as pepper and sauces and pickles, and other things mentioned in Chapter XV.

Being clogged, they need to be cleansed. How can they cleanse themselves ?

First, they can avoid excess : they can take the right amounts of the right foods and drinks at the right times ; nature will then help to get rid of their poisons, etc., by degrees.

Secondly, they can take such foods as figs or prunes or apples, or other fruits, and celery and some other vegetables and salads that will actually cleanse them.

These foods may cleanse them in one or more of the following ways.

The pips and the fibre may irritate the walls of the stomach and bowels, and so make the stomach and bowels work quickly—almost feverishly—and pass their contents along rapidly.

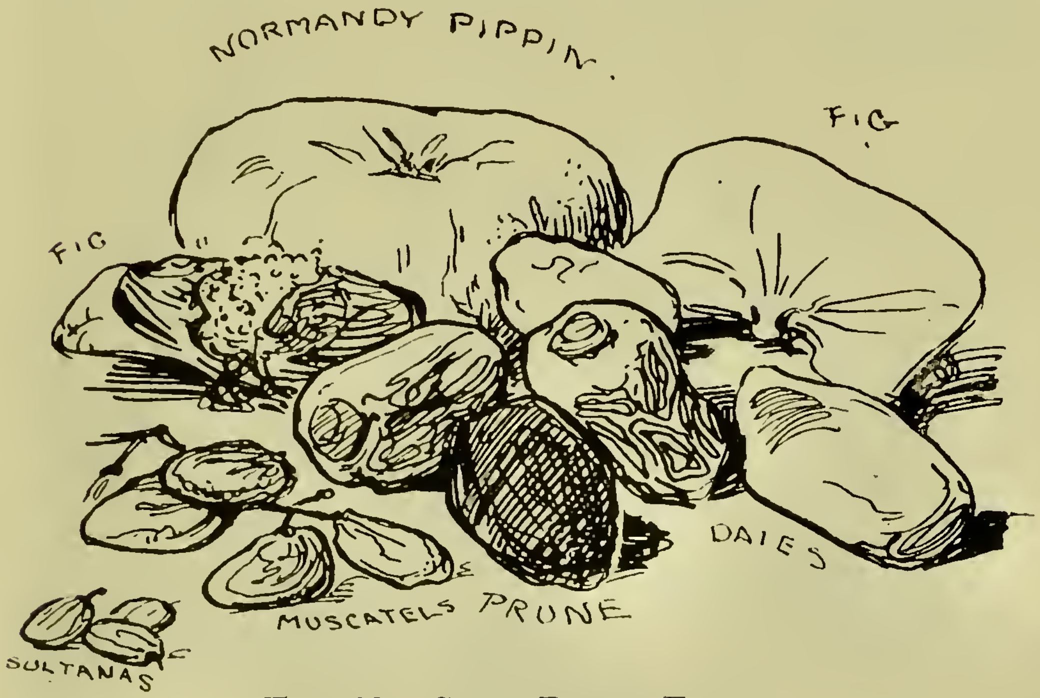

FIG. 63.—SOME DRIED FRUIT.

The water may take up and carry off some of the impurities. Needless to say, clean and soft water, either hot or cool, drunk in the early morning or some time before a meal or late at night will help to cleanse the body.

Another important aid is exercise, which tends to make the lungs and the skin work freely, and so get rid of waste.

Another aid is regularity. Be as regular as you can in all your habits of body and mind.

Bad thoughts—thoughts of anger, fear, worry—are poisonous, while well-wishing, cheerful, hopeful thoughts are tonic, if not actually cleansing.

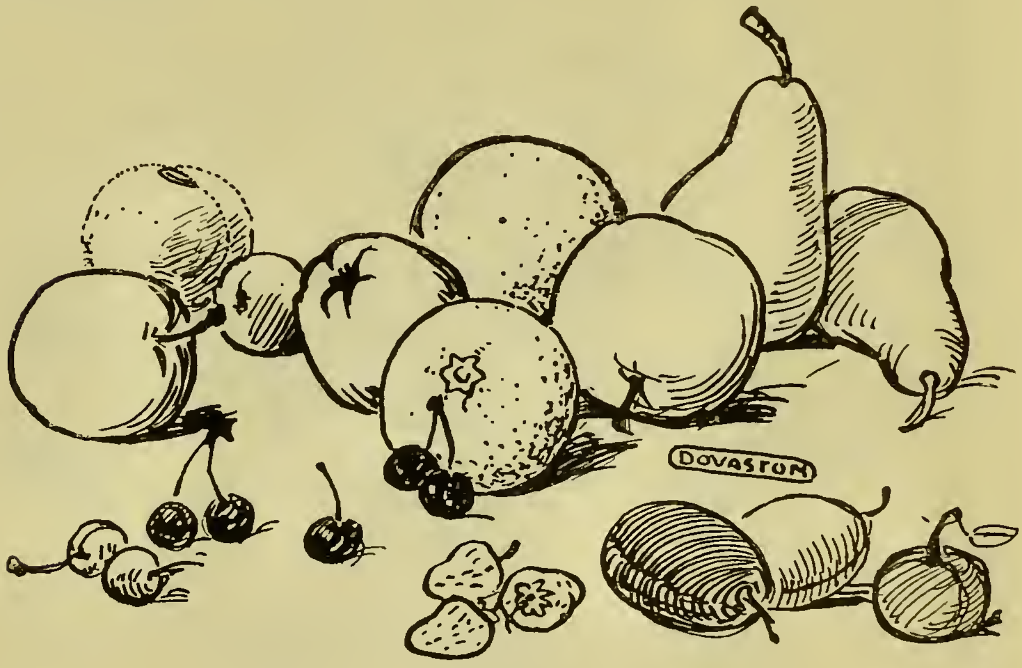

Fig. 64.—Some Fresh Fruits.

Remember that there are some foods that seem to be cleansing because of certain "salts" in them. Notice how easily you can clean rust off a knife by means of water in which potato peelings have been boiled, or remove ink stains by lemon-juice. Among the cleansing foods are juices of vegetables (including onions and celery), juices of fruit (especially lemon and apple), barley water, and some herbal drinks, such as dandelion tea.

If we did our best to avoid much useless drink and excess of food, and if we took fruits and salads or well-cooked vegetables, and a few simple remedies, at the right times, and if, besides practising healthy exercises, we kept our skin clean by warm water, good soap, and rubbing, and kept our thoughts pure and healthy, we should be very unlikely to need those strong pills and medicines which cost so much and scarcely ever bring about a real and lasting cure.

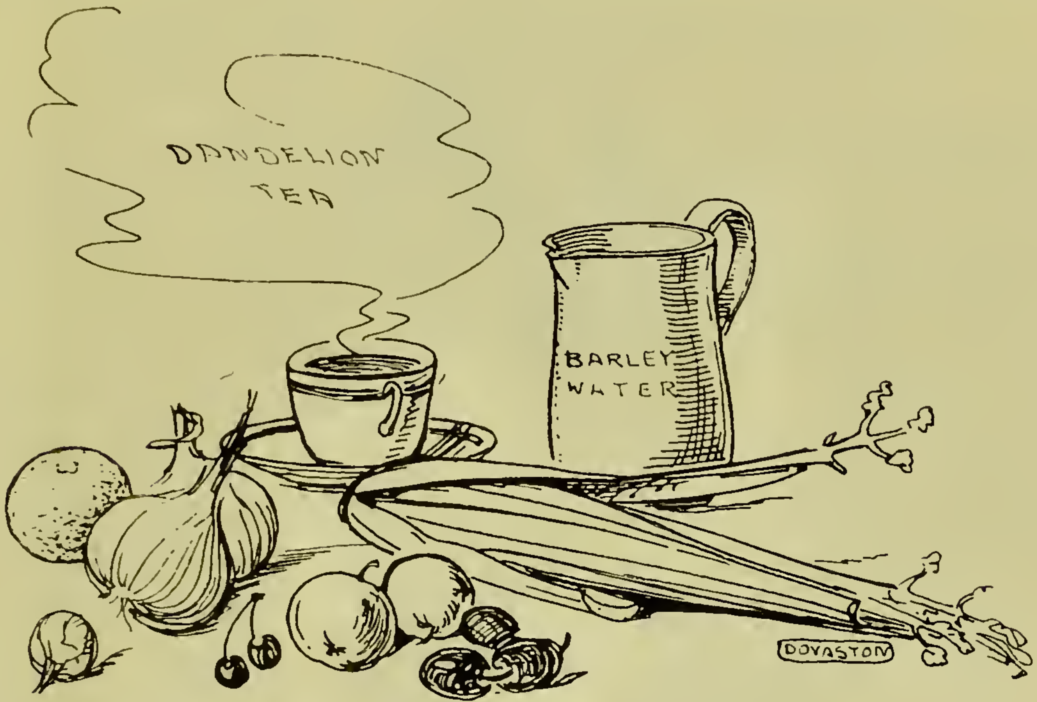

FIG. 65.—CLEANSERS.

Prevention is better than cure: it is certainly cheaper.

XII

FOODS THAT SPUR AND CLOG

SO far we have been thinking chiefly of what to eat. It is equally important to know what *not* to eat or drink ; for we may have a meal that is perfect in so far as it contains all the elements which we want, well-balanced and in a pleasant and digestible form, and that, in spite of this, may do us even more harm than good because it contains what will harm us by over-stimulating us, by irritating our stomachs, or by clogging us.

As an instance, suppose we had the very best possible meal, but added to it some raw whiskey or gin, some pickles, mustard, cayenne pepper, and heavy pudding, and then very strong tea, we might suffer more than we gained, in spite of the good things we had taken ; because the wrong things we had taken with the meal would stimulate and clog us.

Some time ago, my kitchen fire had been lighted for several hours and had burnt up a great deal of fuel, yet my bath-water was almost cold. Why was this ? Because the flues were clogged. I had the flues cleaned, and the next morning a very little fire gave me hot water in about half an hour.

So it is with our bodies. We are often clogged, and seem to need more food. If we could only clean ourselves, we could work with very much less food. It is the clogging that costs so much. On the first day, thanks to the clogging, I had to use ten times as much fuel as on the second day, and with not nearly so good a result.

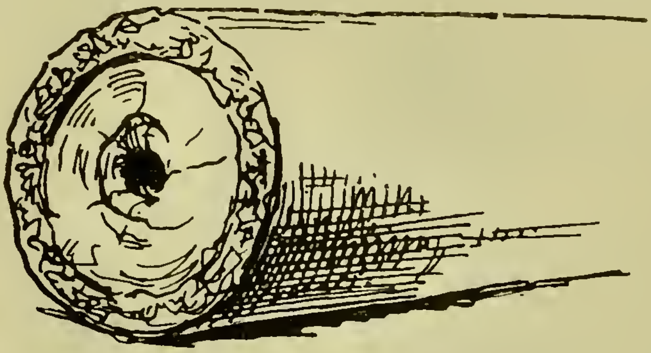

Fig. 65a.—A Furred Iron Pipe.

Think again of this. You are turning the handle of a machine. You find it hard work. You take the handle off and look at the machine closely, and you find that some grit is inside. You clean the grit away, and the handle works smoothly. Just a speck of dust or grit is enough to stop a machine or a watch, such as you see here (Fig. 65b).

In our food, then, we ought not only to take what is right, but to avoid what is wrong, what will clog us.

What will clog us ?

Some people say one thing; some another. Some people say that meat and other flesh-foods clog us; others say that a large amount of starchy and sugary foods clogs us; and so on.

Others say that it does not matter what we eat, so long as we do not eat too much; they say that it is neither meat nor much starchy and sugary food that clogs us; they say that it is excess that clogs us.

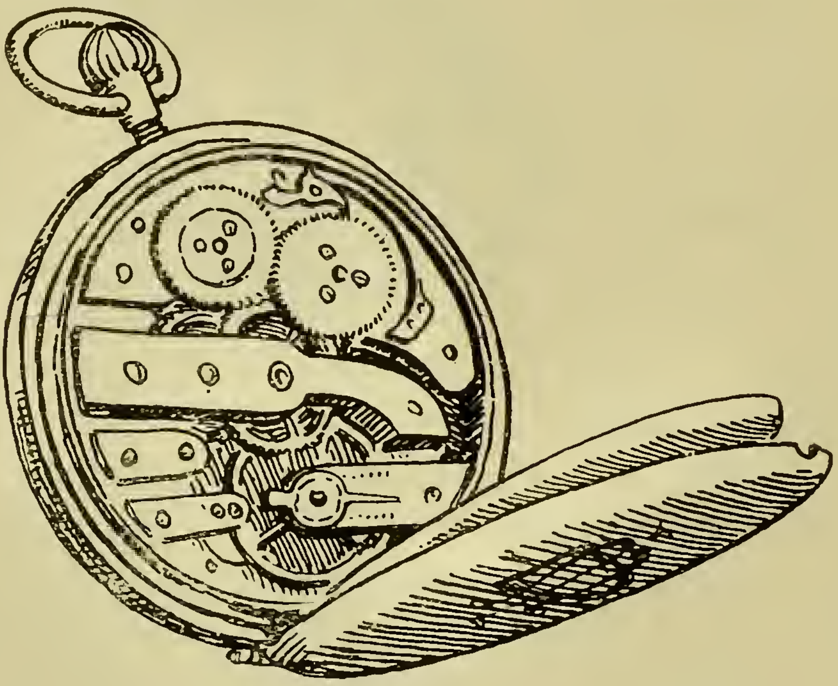

FIG. 65B.—WORKS OF A WATCH.

And there is some truth in this. Cornaro, whom we have before mentioned, when he was over forty years of age and very ill, began to take far less food than before, and became far healthier than before, so that he lived to be nearly a hundred, chiefly because he did not clog himself by excess.

Others have been clogged by other things—perhaps by strong tea; perhaps by coffee; perhaps by beer or wine or spirits; perhaps by something else.

How can we avoid clogging ourselves with food, whether with the wrong food or with too much food?

First, we can choose pure foods. Among the pure foods must be counted good bread.

Then we can take cleansing foods. Fruit may be classed as a cleansing food. It is not very nourishing. Its chief value is not that it builds the body, but rather that, like salads and well-cooked vegetables, it helps to keep the body clean and free from clogging.

One of the hardest things to understand about clogging foods is that at first, perhaps, they do not seem to clog us at all. You see a man who looks miserable and dejected. He takes a glass of beer or a cup of tea, or else he smokes a pipe or cigar, and he seems to become happy. Can you call the beer or tea or tobacco a clogging thing? Surely not, you might say, because he was depressed before, and he is happy now.

But what is the full effect of the beer or tea or tobacco? It may be to clog him still more than before. At first it served as a kind of spur, but afterwards hindered him a great deal.

There are many foods that are pleasant and comforting when we take them, but in the end are harmful to us. We call a certain class of these things stimulants; they prick us and spur us on, without really giving us new power; they just help us to call up and use the power which we have in reserve.

You see here a picture of a man giving a cheque, and getting money for it. Just imagine yourself in his place. You have money in the bank. It is called your capital. You have no money in your pocket; you want part of your capital; you write out a cheque; you give it in to the bank; and the bank pays you money. That cheque helps you to call up and "draw on" your reserves. But if you always lived in this way, by writing out cheques and drawing on your reserves, you would soon be ruined. The cheque does not add fresh money to the bank; it simply helps you to get out money that you have there already. So it is thought that beer and tea may be compared with a cheque, and your body may be compared with a bank. The stimulant helps you to get out and use any strength you have, but it does not give you new strength. So it leaves you poorer.

Is it, then, quite wrong to take a stimulant?

Suppose you feel tired. The sensible thing to do is to sleep or rest or try some healthy amusement. But it may be that you have work to be done, or that you feel too restless to sleep. A cup of tea or coffee might help you to feel fit for your work, might help to take away your restlessness. Is it altogether wrong to take it? Is it altogether wrong to smoke?

For the young it is generally agreed to be wrong. As to older people, we cannot discuss it here. For younger people stimulants are foolish, because young people want all their strength saved up.

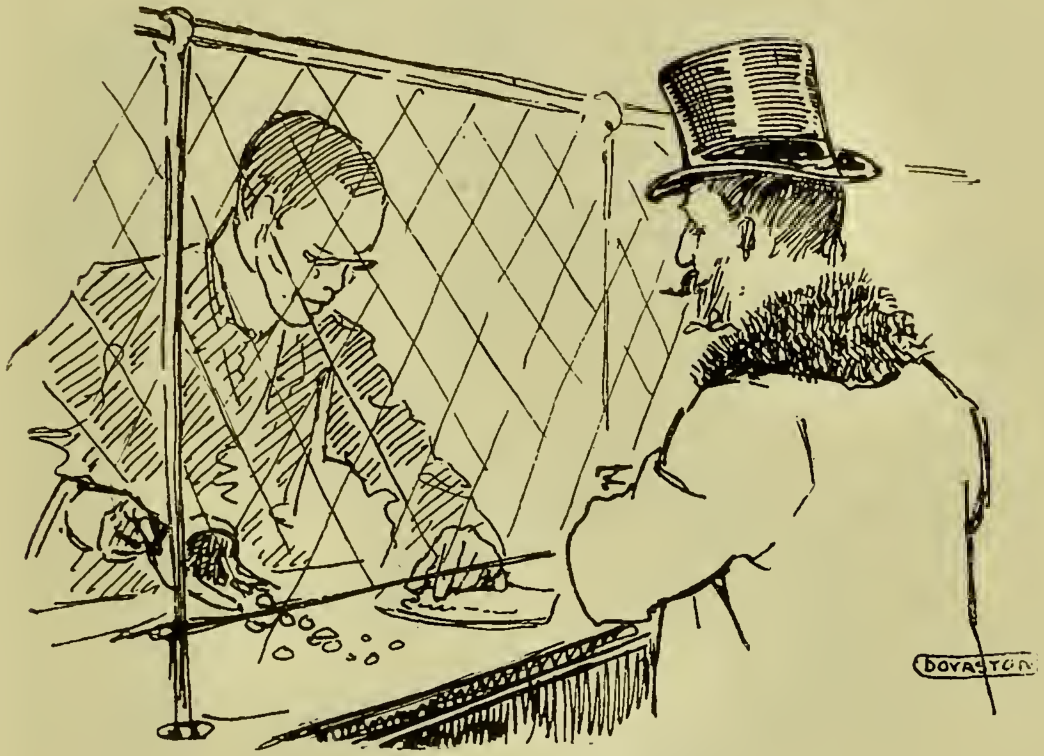

FIG. 66.—CASHING A CHEQUE.

What is there better for you to take than stimulants?

It is far better to take such foods as will build your body and repair its waste; that give it fuel and will not clog it; then you will not need to draw on your capital; you will always have enough strength to use from the food you take.

Fig. 67.—Horse being Spurred.

Feed rightly, then, and you will not need stimulants. Get enough proteid, fuel, and cleansing elements in your food, and your body and mind will work easily; you will not be so liable to feel tired.

Do what will help you to digest this food, to keep your stomach and other organs in order.

FIG. 68.—HORSE GOING WITHOUT A SPUR.

That is, take right exercise, and sensible rest, and think only good thoughts.

Stimulants are very dear things. You only need them because your body is clogged. If you live sensibly, your body will not be clogged.

Remember that different people are affected differently. Some, like myself, are clogged by quite a little meat juice (in the form of beef-tea or meat soup, etc.), others by shell fish, others by cheese, others by lentils, others by eggs, others by other foods.

Some do not seem to suffer much from small amounts, but suffer from large amounts: from large amounts not only of alcoholic drinks, tea, coffee, cocoa, tobacco, meat-juice, and so on, but also from large amounts of foods that are generally thought harmless, such as bread, butter, milk, and sugar.

For such things, though they may appear to do us good at the time, are, if we do not need them to build our bodies, likely to clog us and so prevent us from working easily with our bodies and our minds.

The clogged body needs a stimulant as the jaded horse needs a spur. How much better it is to be able to do without a stimulant, as this horse does without a spur.

XIII

FOODS THAT PLEASE US

IT used to be thought at one time that a thing could not possibly be good for a child unless it was more or less unpleasant. When I was ill, I was given very nasty medicines and very dull foods.

Every one knows how the palatable and attractive foods, nice to look at, smell, taste, and think of, start the saliva, which helps to digest the starchy part of our food. That is one reason why attractive foods are good for us.

Another reason is this. Not long ago, Professor Pawlow proved that certain foods—especially foods which we like—started the flow of the gastric juice, which helps to digest the body-building or proteid part of our food.

Dr. Cannon also made some very useful experiments. Digestion, it is well known, is due not only to digestive juices, but also to certain movements of the organs, which churn the food, and bring its many particles in contact with the juices, and pass it on along the digestive canal.

Dr. Cannon found that anger or depression tended to make these healthy movements stop.

So pleasant taste is a great advantage to us in more than one way. It gives us enjoyment and this serves as a tonic to the system ; it helps us to digest our foods.

But in some pleasant tastes there is danger—there is threefold danger.

First of all, many people come to depend on these pleasant tastes—such as curry, pickles, etc.—for their enjoyment and digestion.

Secondly, too many pleasant tastes may lead to excessive eating. When enough food has already been taken to build the body, repair its waste, and give it fat and heat and energy, the nice flavours may tempt us to go on eating more than is needed.

Thirdly, they may excite the thirst ; and, though perhaps the thirst will not be quenched by alcoholic or other unwholesome drinks, yet even water may now do harm by cooling the stomach and weakening the gastric juice.

The poorer classes in England, and, indeed, all classes, make a great mistake in having much food that is not attractive in itself, and so is not likely to be digested ; or else in having much food that is attractive through wrong or excessive flavouring (fiery sauces, etc.), and so is likely to make them depend on such flavourings for the appetite.

Another great mistake—pointed out by Dr. Harry Campbell and others—is the free use of wet starchy foods, foods that Dr. Campbell calls "pappy." Most starchy food needs abundance of saliva to digest it, and saliva comes partly through mastication. As we shall see in the next chapter, most people who swallow these sloppy foods without biting them, probably fail to digest these foods, which then ferment within them and irritate them.

How far better it would be if we took most of our starchy foods in a dry form. I do not mean in a dull and leathery form, but in a crisp form; for instance, in the form of well-made toast or rusks or biscuits.

But, perhaps you will ask, how can we be sure that these dry starchy foods will be attractive enough to rouse our appetite and our digestive juices?

The best answer is that, with genuine hunger, they are nearly sure to do so, especially if they are eaten in a leisurely way. Get really hungry and try.

Mr. Horace Fletcher and others have found out a third fact of great importance. It is that, with real hunger and careful mastication, there is greater enjoyment and more taste from many foods which to gluttons and fast eaters are almost tasteless. The test of real hunger is not to be able to eat a very large meal of highly-seasoned and special delicacies, but to be able to eat a fair-sized meal of simple foods like bread and butter, nuts and fruits.

The pleasant tastes of foods, then, may depend largely on our own hunger; so that what is dull and even repulsive to the glutton may be attractive to the healthy person.

But suppose we are not yet healthy, how shall we secure enough pleasant taste to arouse our appetite and help our digestion?

Some foods, such as good bread and butter, eaten with a few nuts, good milk or cream taken with fruit, good cheese, good eggs, have a fine flavour in themselves. They are body-building and also appetising.

Other foods—such as parsley, thyme, sage, lemon, onion—are not body-building, but are appetising, at least to those who like them. Less "natural" foods of this class are tomato and mushroom sauces and "ketchups" as bought in shops.

In the case of many of these foods there is a further attraction—the smell. Appetising smell stimulates the flow of the digestive juices just as appetising taste does.

In the case of celery there is a still further attraction—the crispness.

Then there is the appearance. What is more pleasant to look at than a good salad or a plate of fine fruit? The appearance of our food, its colour, etc., is of great importance. The food should look clean and bright.

Other influences that affect our enjoyment and our digestion are our surroundings—especially the people who are taking the meal with us. What a difference it makes whether they are gloomy and grumpy or happy and jolly!

Then there are our own thoughts. We get good news and at once we feel well; we get bad news and at once we feel disinclined for food.

FIG. 69.—APPETISERS.

It is surprising to find how our feelings are affected by our expressions. Professor James tells us that we should always sit up and behave and look as if we were happy. Then happiness is bound to come to us.

XIV

HOW OUR BODY CHANGES FOOD

THERE was a time in the history of the human race, when all foods were eaten in a raw state. Then these foods were acted upon only by certain juices of the human body. Those which we have to consider are found in the mouth and in the stomach. That in the mouth is called saliva, that in the stomach gastric juice.

One of the greatest miracles of every day is digestion. Here is a little piece of bread. What happens to it ? What have you to show for it ? You walk a step ; you have that to show for it ; the bread has given you some of the power to walk a step. How can you turn bread into a step, a movement of muscles ? Does it not seem impossible ? A conjuror who seems to turn an egg into a chicken, a glass of water into a bowl of fish, and do all sorts of clever tricks with cards, is not half so wonderful as this conjuror of yours, the digestion, which turns food into power.

This is what happens, though how it happens

FIG. 70.—A CONJUROR.

we do not know. We do not help it by thinking about it. Some people hurt themselves by thinking too much about their digestion. But it is not likely that you will be hurt. On the contrary, you ought to understand what goes on.

You put something into your mouth; you chew it to break it up and mix it with the saliva which helps to digest the starchy part of it, and to send it down into the stomach. You swallow the mouthful, and it goes into the stomach.

The stomach churns it up; mixes it with the stomach's gastric juice, which helps to digest the body-building or proteid part of the food. Then the stomach passes the food on, till at last the food reaches the intestines. (See Fig. 5.)

In the intestines other juices are poured upon the food; more churning goes on.

Then by degrees the digested food is absorbed and becomes blood, which is sent all over the body to feed the body and give it power. This power is either used or stored up.

When is food best digested?

When it is well chosen and well prepared. There was a man at the Aquarium many years ago who swallowed the heel of a boot, tin-tacks, sawdust, glass, and an oyster-shell; at least he appeared to swallow these things. These things were not well chosen, they would not re-build his body or repair its waste. Neither were they well-prepared.

But if they were what our food too seldom is, if they were well masticated, that would have helped the man, perhaps not to digest them, yet not to be hurt so much by them.

Then food, if it is to be well-digested, needs to be well-churned inside us, and to be passed on at the right time.

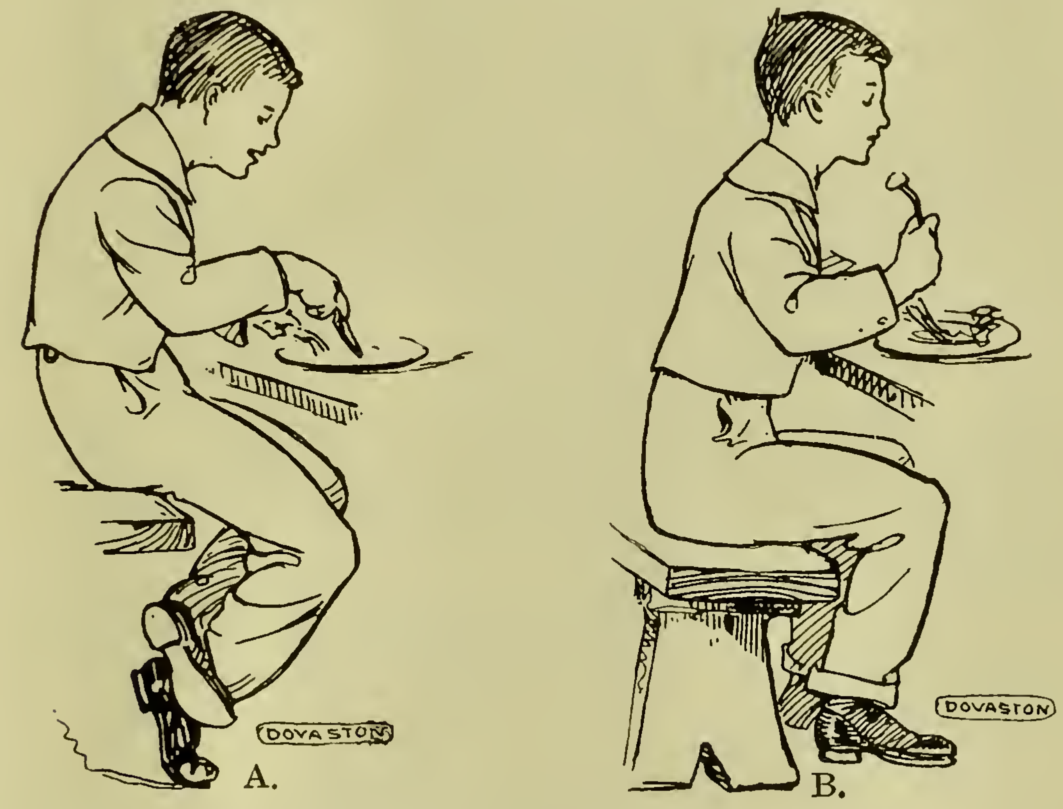

FIG. 71.
WRONG POSITION FOR EATING. RIGHT POSITION FOR EATING

Dr. Cannon, as we said just now, found out that these churning movements, these passing-on movements, depended a great deal on the state of mind. If he frightened a cat, the digestive movements of the cat stopped, or were otherwise affected.

Others have found that, in case of shock, or of grief or anger or fear, the digestive juices are weakened. So the state of the mind alters the digestion. A learned old man, who died not long ago, just before he died could not digest his food well unless there were cheerful people talking around him.

Does anything else make any difference? Suppose there is a meal before us, well-chosen and prepared, perhaps cooked by a very clever cook, then well-chewed by a person with a cheerful mind, will he digest that meal?

If he takes very strong tea that has been standing for a long time, probably he will not digest that meal well.

Or, again, he may fail if the light is bad and the room gloomy, or if there is very little air and the room stuffy.

Or even if he breathes wrongly.

Or if he sits in the wrong position, slouching forward, so that his stomach is pressed upon by his lungs (see Fig. 71, A, B).

And you know how many people will not digest their food if they take too much violent exercise, or do too much hard work, directly after it, or even if they come straight from their hard exercise or hard work to their meal.

You see, then, that the important thing is not only to have good food, and to put that into you, but also to digest it well. It is as true of food as of information, that a little digested and ready for use, is better than a lot undigested and unready for use.

Are some things easier to digest than others? Yes, but all people are not alike. I will give a few instances.

I know certain people whose favourite foods are wholemeal bread, lentils, eggs, and cheese. They seem to digest these things well. I know other people who seem to be unable to digest coarse wholemeal bread; it makes them uncomfortable. Others cannot digest lentils, especially when they are badly-cooked; others cannot digest eggs, especially when they are hard-boiled; others cannot digest cheese, especially at the end of a large meal.

These people, however, seem to be able to digest beef very well.

Others, again, cannot digest beef well; it makes them uncomfortable. They get on capitally with bread, butter, and milk.

In all these cases there is a different degree of power to digest. The people will be well not only because they choose foods that are valuable in themselves, but also because they choose body-building foods that can be digested, and that can build their bodies.

Digestion, then, depends largely on whether the foods chosen suit the individual or not. When I used to eat flesh-foods, I do not remember ever to have felt ill from taking cheese or lobster or cucumber, which are said to be most "indigestible." On the other hand, I used nearly always to be badly affected by oatmeal in any form, or by much milk or sugar or cocoa, which are highly recommended.

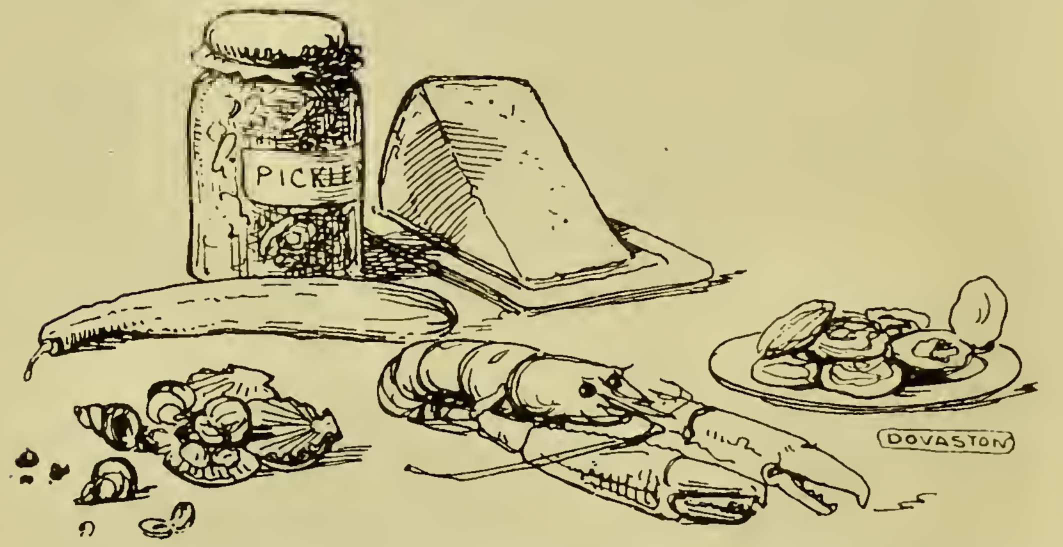

Fig. 72.—Foods supposed to be Indigestible.

I know one man who is quite different from me in this respect. When he gets plenty of exercise and fresh air, has good news, and is among pleasant friends and pleasant surroundings, he hardly knows what indigestion means. It seems as if he could digest anything. But deprive him of his exercise and fresh air, let him have bad news, let him eat in a dingy room with people who talk gloomily of their diseases and worries, and he suffers terribly from indigestion, no matter what he takes.

You see, then, that most people are affected by the foods that they choose, and by the way in which they eat them. It is clear that we should avoid some foods, and select others, within certain limits.

The mistake is to think that only one way of eating is right, and that we must eat in that way, however uncomfortable it makes everybody else.

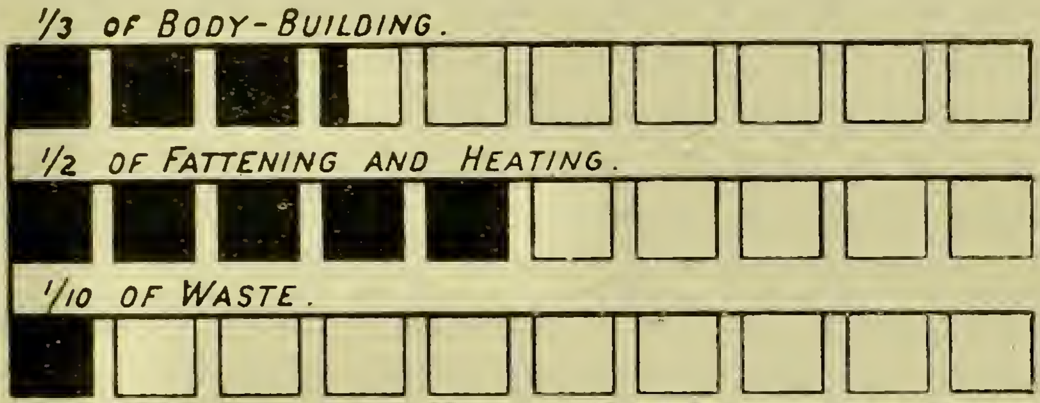

Fig. 73.—Table Showing Value of Slow Eating.

Thorough chewing of food is commanded by an American, Mr. Horace Fletcher, whom we have before mentioned. And it is as well to hear what he has to say before we go further.

He says that, by chewing every mouthful of food so long as it has any taste at all, we get more taste from our food, enjoy it more, and need far less food; for we use more completely what we do take. Here is a Table which I have made out from one of his books. He claims that, when he thoroughly masticates all his food (even his liquid food), he needs less than half the amount that he is supposed by other people to need.

Besides the improvement in his teeth and his breathing, and in his mind, he maintains that he is free from indigestion, that he is much cleaner in body than ever before, and that he has no strong wish for any stimulants such as alcohol, tea, or coffee. Indeed, he is sure that he only wants the foods that really suit him.

I have tried his plan, and for a mouthful of some foods it requires over a hundred bites. Few people go so far as to give this amount of carefulness to their chewing. You have all heard of Mr. Gladstone, whom you have seen enjoying a cup of coffee; well, Mr. Gladstone's plan was to take thirty or thirty-two bites to a mouthful, though some mouthfuls must have needed more, and others less.

Whether one has any rule or not, it seems certain that more careful chewing is of the very greatest importance; that the foods which get least of it—starchy porridges and puddings—are among the foods that need most of it; and that the more tired one feels, and therefore the less inclined to eat carefully, the more carefully one ought to eat in order not to throw too great a strain on the stomach and other organs.

For these organs, though they can churn the food, have no teeth to break it up with. It is only reasonable, from every point of view, to give the teeth their proper work.

Yet to-day very few persons chew their food well. One cause is the hurry of modern life. Another is the way in which the food is prepared. It is often prepared in such a way as not to encourage people to masticate it.

XV

WHAT COOKING DOES

A BAD cook, inattentive to her work, can easily lessen the value of foods ; she can turn ten shillings' worth of good foods into nasty-smelling cinder-like rubbish in a very short time. But this is not the kind of change of which this chapter will tell.

A good cook, coming into a badly-managed kitchen, will work wonders of a different kind.

The odds and ends which the incompetent cook would have put into the dustbin, the good cook cleans and keeps, or else uses in the stock-pot for soup, or in some other way (Fig. 74).

Carefully she keeps the vegetables and milk, etc., fresh in a cool place.

The first result of good cookery, then, is economy.

The second result is improvement in the food itself. Good cookery takes a tough cabbage and makes it soft enough to be eatable ; it does the same to the outside pieces of celery ; it turns a

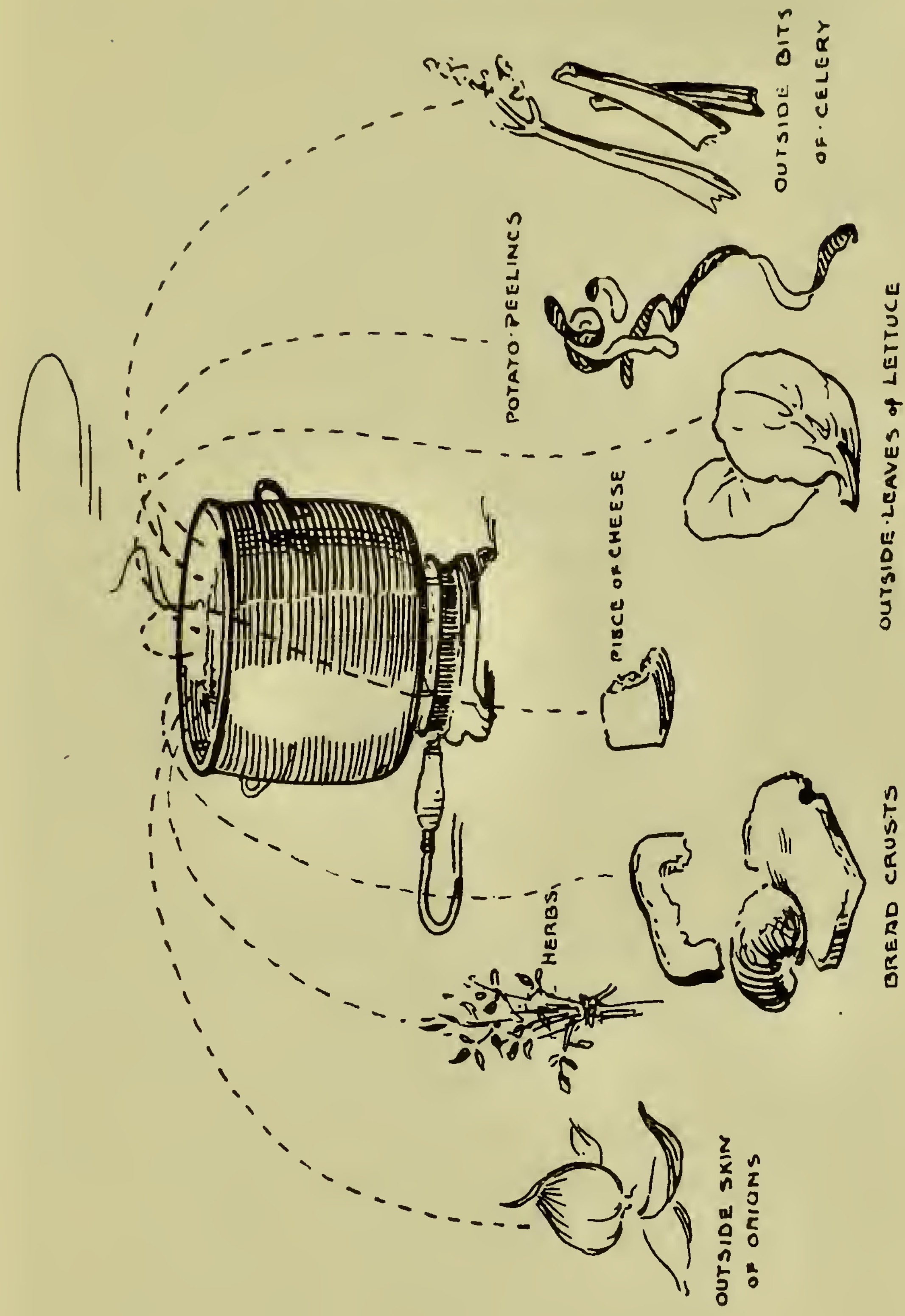

FIG. 74.—A STOCK-POT WITH CONTENTS WHICH A CARELESS COOK THROWS AWAY.

raw potato into a crisp fried potato; it turns pulpy bread into nice toast; and so on.

The third result is better taste. Good cookery improves the flavour of the cabbage and potato and eating-chestnut. It makes the almost uneatable raw haricot beans delicious by boiling them well and adding a nice sauce or gravy; it changes the flavours, making hard and unpalatable macaroni into cheese-macaroni, macaroni and tomato, and so forth; it can give an egg any one of a hundred tastes.

Then good cookery can help the digestion, not only by altering the consistency and the taste, but also by actually imitating the process of digestion. There is some terribly indigestible starch in raw flour. Good cookery prepares it with other things, bakes it, and offers you a crisp and delicious and digestible biscuit. Good cookery breaks up the food into particles that can easily be assimilated.

Good cookery does not save everything. It throws away the used up and worthless parts. A great deal of the contents of the stock-pot, after the precious juices have been drained off for soup, is thrown away (though some day a scientific inventor will show us a use even for these things). Indeed, it is part of good cookery to destroy what is useless or harmful.

It purifies. Not only does the washing free the food from dust and dirt; the heating kills disease-germs. Good cookery cleans and sterilises food without robbing it of its nutriment and pleasantness.

Among the more general changes made by cookery are the changes of weight. Here are some very striking instances.

There are eleven things to be cooked :—

1. 3 lb. of chicken to be roasted.
2. 8 oz. of beefsteak to be grilled.
3. 2 kippers (8½ oz.) to be fried.
4. 2 cod cutlets (15½ oz.) to be fried.
5. 1 lb. of haricot beans to be boiled.
6. 4 oz. of oatmeal to be boiled and made into porridge.
7. 19½ oz. of potatoes to be boiled.
8. 10½ oz. of potatoes to be baked.
9. 1 lb. of cabbage to be steamed.
10. 1 lb. 5 oz. of wholemeal to be baked as bread.
11. 1½ oz. of dried milk to be made into “gruel” with hot water.

Now what difference should you think the cooking would make to the weights ? You would hardly believe how great these differences are, though of course they would not always work out quite the same. This is how they worked out in one trial.

1. 3 lb. of raw chicken, roasted, became 1½ lb.
2. 8 oz. of beefsteak, grilled, became 5¼ oz.
3. 8½ oz. of kippers, fried, became 8¼ oz.

4. 15½ oz. of cod, fried, became 13½ oz.

5. 1 lb. of haricot beans, boiled, became 2 lb. 1½ oz.

6. 4 oz. of oatmeal, boiled and made into porridge, became 1 lb. 5 oz.

7. 10½ oz. of potatoes, boiled, became 11 oz.

8. 10½ oz. of potatoes, baked, became 6½ oz.

9. 1 lb. of cabbage, steamed, became 1 lb. 2 oz.

10. 1 lb. 5 oz. of wholemeal, baked as bread, became 2 lb.

11. 1½ oz. of dried milk, with hot water, became 8 oz.

Is not the change extraordinary in the case of the haricot beans boiled and the oatmeal made into porridge?

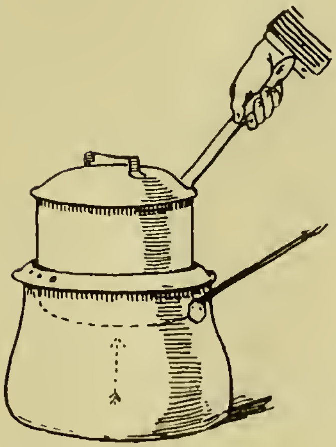

FIG. 75.—DOUBLE-PAN COOKER.

You must see what a difference it makes whether you calculate the food-value, especially the body-building or proteid value, when the food is raw or when it is cooked. 1 lb. of raw haricot beans may contain more proteid than 2 lb. of boiled haricot beans, for at least half the weight is now not beans but water.

Exactly how much water to use—that is one secret of good cookery.

First, remember that some of the best elements of green vegetables are in their juices: these juices may be very precious medicines. A bad cook adds too much water to them, and, when they are cooked, she takes the water which is left, and pours it away, and so, very probably, makes the vegetables far less digestible, and certainly far less likely to give us health than if she had cooked them, in little or no water, in the inside pan of a double-pan cooker (Fig. 75).

A bad cook can spoil the digestions, tempers, and work of a whole household, as well as waste their money.

A good cook can improve the digestions, tempers, and work of a household, with a quarter of the materials used by the bad one, and with scarcely any waste.

XVI

HOW FOODS MAY HARM US

SO far we have spoken of foods that feed us, satisfy us, and cleanse us, as though these foods were quite pure and nourishing. But, unhappily, they are not always so.

For instance, there are many kinds of mushrooms; some kinds poison a certain number of people every autumn. I will, therefore, tell you how a doctor describes the edible mushroom, which is quite safe.[1] "It has a characteristic pleasant odour, the cap is fleshy and fairly thick compared with the gills, and its upper white surface is speckled with grey. It 'peels' very easily. The stalk grows from the centre of the cap, and does not produce any milky juice. After keeping, the head does not become soft and wet. The gills vary in colour from a pale yellow-brown to a blackish-brown, and they are free from the stalk."

Then, if a food is allowed to "go bad," as we say—i.e., if it is not eaten while fresh—all sorts of tiny living creatures grow and multiply in it, and may turn the food into a poison. As a rule these germs, as they are called, only grow in moisture and between certain degrees of heat. So you can preserve foods longer by drying them, by keeping them in ice, and by exposing them to great heat and afterwards keeping them away from the air.

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[1] From Thresh and Porter's *Preservatives in Food.*

The first way of preserving foods is often used in the fruit trade (see Fig. 63). Apples and plums and apricots are dried and packed tightly in boxes, when they can be sent all over the world and used for food at any time. The second way is used in preserving meat that is sent from New Zealand and Australia into England. The third way is common in making tinned foods ready to go to different countries.

You must remember that, after you have bought dried fruits, you should always wash and boil them well before you eat them—and that you must be very cautious in buying and using any tinned foods. When you are going to buy tinned foods, tap the tin sharply. If there is a hollow sound, the tin is "blown." Have nothing to do with it. Buy foods preserved in glass or earthenware, in preference to foods preserved in tins. Do not ever let remnants of food stand in a tin that has been opened. Empty the contents right out into a dish, and throw the tin away, if it cannot be made useful.

Then, besides these dangers that may come into foods in a natural way, there are dangers which are put into them in a way that is far from natural. First, there is the danger of dirt. The dirtiness of vessels used in preparing foods, and even the dirtiness of the place in which foods are prepared, have been known to cause wholesale poisoning. Once fifty children in Birmingham were made ill by eating ice creams that had been prepared in a dirty back yard. At another time, more than a hundred people in Derby were made seriously ill, and some of them died, because they ate pork pies which had been made in a place that contained poisonous germs from the inside of a pig.

You will see from this that you must be most particular in your cooking. Do not let food stand uncovered for flies and dust to get into it. Be very careful that no air from a drain is allowed to come near the place where your food is kept. Never put near food water that has been used for washing insides of animals.

Then there is the danger of taking animal parasites with food. To avoid this, cook meat very thoroughly right down to the bone, and wash vegetables carefully in three waters, the first containing salt—then drain and dry them well before you cook them or eat them raw.

Shell-fish have been known to become poisonous when they have been living in water that is made foul by receiving the sewers of a town. It is wise to keep all shell-fish in fresh salted water, changed every day, for a fortnight. It is said that this takes away all danger of poisoning, except in the case of the mussel. This fish has, according to a German doctor who some time ago inquired into an outbreak of illness near his home, a special way of developing a poison in itself. At all events such a poison has been found in mussels which caused the death of many people who ate them.

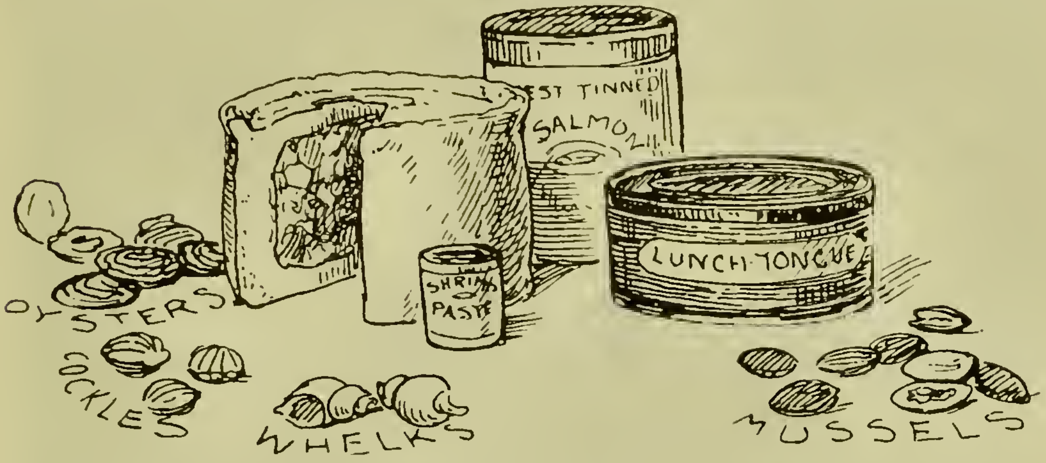

FIG. 76.—FOODS THAT MAY HURT US.

Then, besides these dangers which are due to natural causes, or to dirt or carelessness, there are substances put into foods for various reasons by the tradesmen who make or supply the foods. Sometimes cheap stuff is mixed with dear stuff to produce a mixture that looks like the dearer food and so enables the tradesman to charge a higher price. This is not allowed by law, but it is not very severely punished, because, as a rule, it cannot be proved to be harmful to one's health—it is only harmful to one's pocket.

There is a much more serious danger than this kind of adulteration, as it is called, and that is the putting of dangerous drugs into foods to make them look nice and tempting. For instance, the beautiful coloured sweets that you sometimes like to buy may contain poisonous matter. So may the ornamental cakes that you see with coloured icings. It is better to use the more wholesome white or natural-coloured sweets, or to make good toffee for yourself, than to spend your money on things made for show.[1]

The best safeguards against this doctoring of food are a good eye, nose, ear, and taste. If you have trained these senses to notice everything connected with food, you will not be easily deceived. A very great scientist, Dr. Henry Armstrong, complains that English children in our modern schools do not notice ordinary things; they are so bent on learning from books that they have no time to observe what goes on around them. This is a pity. For if you do not learn to notice such important matters as food, it is not of much use for the Government to make laws to protect you.

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[1] There is a recipe for home-made toffee at the end of the chapter.

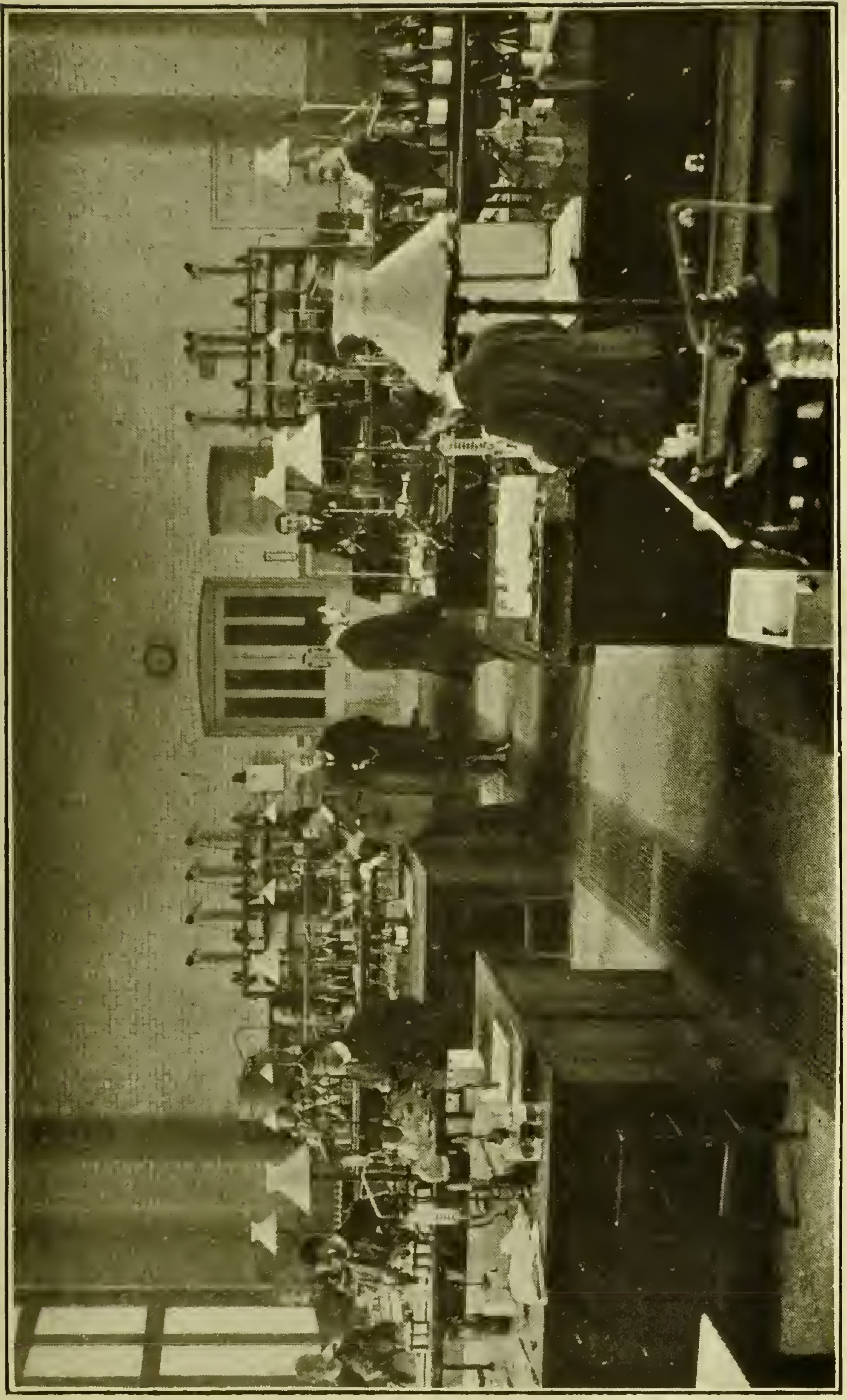

FIG. 77.—A GOVERNMENT LABORATORY. ANALYSIS OF FOOD AND DRINKS (IN GENERAL).

But, you will ask, how does the Government protect me ?

You see here some rooms in the Government Laboratory, Clement's Inn, London. Some of the instruments in use are very costly ; and a great deal of time and trouble is spent by the analysts, whom you see at work. Our Government spends a great deal of money here, so that it may prevent us, as far as it can, from being robbed or deceived. Every district of England has a Public Analyst, whose business it is to find out whether samples of food given to him by people who live in that district are what they ought to be. Private persons can send anything they like to the Public Analyst of their district, if they are willing to pay him for his trouble. But no private person has a right to send to Clement's Inn. If there is any doubt about what a Public Analyst says, a magistrate can take the matter up and get it settled by sending here, but only a magistrate has the power to do so. Wonderful things have been found out in this place, and every year wise new rules are being made because of what has been found out. The head of the Government Laboratory, to whom we owe these pictures, told me that some traders are made so keen and clever by training that their eyes and ears and touch are able to protect them from being imposed on. I want you to train yourselves in your small way.

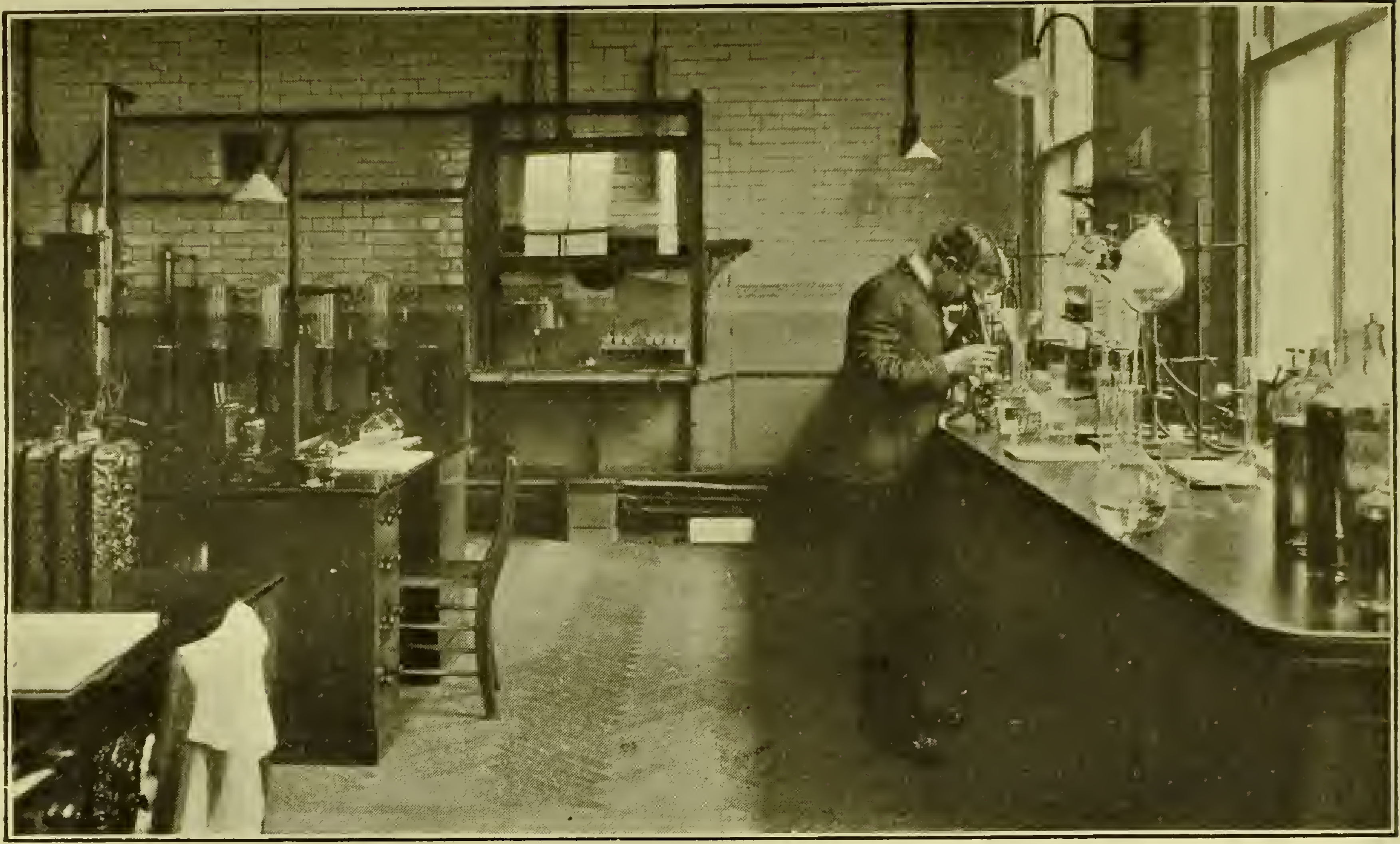

Fig. 78.—A Government Laboratory. Analysis of Water.

For instance, look well at all the milk you see. Find out where the best comes from, and get your milk there. Good milk should be clean—i.e., it should not leave dirt at the bottom of the glass after it has been standing. It should throw up a good cream when it stands for an hour or two, although this may vary in depth from day to day. It should not have a bluish colour, it should not be yellow; it should be a rich white. If, by chance, *no* cream is thrown up, do not therefore condemn the milk. Sometimes it is shaken up violently (homogenised) so that the cream may not rise. You can find out whether this has been done, from the people who supply the milk to the dairy where it is sold.

Then try to understand how foods are made, and what chances they have of being pure, so that you may then choose for yourself the most natural foods which have had least handling.

Learn to notice your bread and, if possible, make your own. If it is not possible, then find out the best baker—and choose the one who sells loaves that keep fresh longest. Poor bread soon hardens, but the better kind keeps for days in good condition. Notice the appearance of all foods, and compare them with good specimens when you get the chance. By doing this you are training your eyes and your smell and your taste. You are not wasting time.

From what I have said you will readily see that plant or vegetable foods may become harmful. Even strawberries are sometimes tainted because the manure in their soil has been allowed to touch the fruit. The best strawberries are kept surrounded by clean straw while the fruit is growing and ripening. It is well for you to know about what you eat; but if you are ever doubtful as to the purity of your vegetables, it is easy for you to boil them very rapidly for a minute or two in water that can be thrown away. In this case, the vegetable must be cut up so that the heat reaches all parts. If, after this, the vegetable be thoroughly cooked, there will be no fear of its poisoning anybody. Grow your own vegetables if you can (see Fig. 65).

Heat destroys most germs, but the heat must be very powerful, and it must reach all parts of the food that is treated. To make foods harmless by destroying the germs in them is called sterilisation.

Now I will give you two simple little tests. They are used by ordinary people who want to get a general idea as to whether the butter or the sweets they buy are what they ought to be.

Dairymaids in Ireland use the first, in order to find out whether the butter-makers have tried to put water or skim-milk into their butter in order to make it heavier. By law, butter should never have more than sixteen parts of water in every hundred parts of butter.

A dairymaid uses a cone-shaped glass marked to show a hundred equal divisions (Fig. 79). The butter is melted in the tube, the fat rises to the top, and the proportion of water or skim-milk at the bottom may be clearly seen. If this rises above the mark sixteen, the butter is dishonestly made, and should be thoroughly analysed. The way in which this is done is complicated, and requires many specially-made instruments, each one of which corrects or confirms what is told by others.

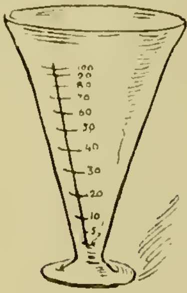

Fig. 79.—Glass for Testing Butter.

The other test is for ordinary sugar sweets. If you want to find out whether they are wholesome or not, pound a small quantity in a mortar (Fig. 80). When it is very fine, add cold water to the powder to dissolve it. If all is dissolved, the sweets are pure sugar. Any colouring, if the solution is coloured, is probably due to a harmless dye. If there is any sediment, filter it very carefully and dry it. Rub it between your fingers and notice whether the colour comes off. If not, the

Fig. 80.—A Pestle and Mortar.

powder is very likely a mineral colouring, and may be poisonous.

Here, again, we must refer the matter to an analyst before we can find out what is wrong. All that this test can do is to give us a general idea. If there is any suspicion of poisonous colouring matter, then you know it, and need not run any risk.

A CHEAP SWEETMEAT.

Melt in a pan 2 oz. of nut-butter: let it boil, and add ½ lb. of golden syrup and ½ lb. of moist sugar. Stir well with a knife, and boil for twenty minutes. Add a few drops of lemon-juice, and pour into a well-greased, shallow tin; then mark it into neat squares.

XVII

HOW TO PREPARE A MEAL

SUPPOSE you have chosen good materials for a meal, materials that have enough of the body-building and other elements, and that are reasonably free from what will clog the system. Suppose you have bought these foods, of fine quality yet as cheap as possible, and pure as far as you know. What then ? Are they ready to be cooked ?

Probably not.

First of all, some of them will almost certainly need to be cleaned ; for instance, the green vegetables have to be cleaned in cold water with a little salt in it, and to be carefully picked and freed from dirty leaves, etc.

The utensils need to be cleaned and got ready, as well as the heating apparatus, whether it is a coal fire or a gas stove.

You yourself may need to be cleaned. Good cookery demands personal cleanliness.

Now, after seeing to all this, you set on one side exactly what you require for your meal.

The rest you put away in the right places: you will learn about these places in a later chapter.

Preparations have to be made long beforehand. For instance, if you are having beans, you had better put them to soak in water for twelve hours before you want to use them. Your soup-materials, consisting of various odds and ends, should have been simmering quietly for a long while. French cooks always make their soup in this way, and it is generally greatly admired.

You must see to the flavourings. There must be just enough to give a delicate taste, and not too great a variety, not enough of any one flavour to drown the others. You will find the simple herbs—thyme, sage, parsley—very helpful in giving nice flavours, and you must always keep them by you.

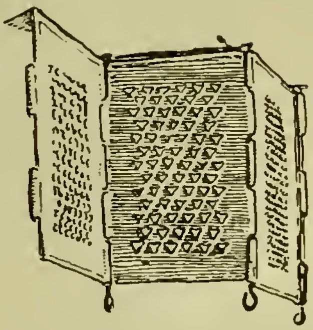
Fig. 81.—A Grater.

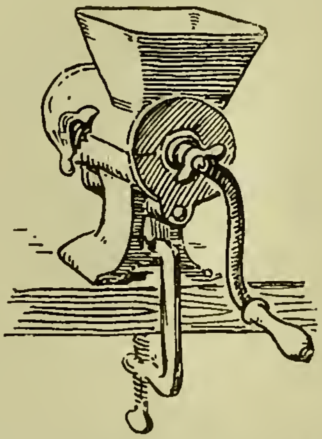
Fig. 82.—A Nut Mill.

Get your utensils ready. Probably you will need, besides cooking-pans, the grater and nut-mill (for cheese, nuts, etc.), the stock-pot, and the double-pan cooker (for milk, vegetables, etc.).

The stock-pot shown here is a very convenient one, but, if you have not one of these, you can make just as good soup in any kind of pan you have. Even an old jar can be used. It can be stood in boiling water and covered down, and left to simmer or boil gently. When the vegetables are boiled to useless shreds, strain off the liquor for use, and burn the shreds, or use them in the garden soil, or throw them away. Then clean your pot thoroughly, dry it well, and start it again with fresh materials. Do not think anything too small to be thoroughly well done in cookery. Take great pains and, above all, be proud of your work.

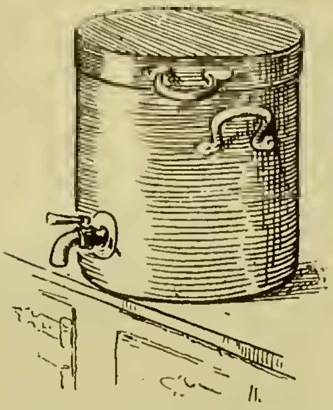

Fig. 83.
A Stock-pot.

The days when a cook was despised are becoming days of the past. A good cook is now known by all sensible people to be an artist and a helper of mankind.

Think what a splendid training and education cookery is. There is in it training for the sight, hearing, taste, touch, smell, and the muscular sense (which tells us about weight, distances, and temperatures). There is training for all the senses.

There is training in discrimination—the power to distinguish small differences of flavour, size, texture, colour, quality. There is training in what is called tact—the power to know what will please other people.

There is in the art a great power to save, as well as a power to earn money. A good cook can secure very high payment. The chef on board a large steamer or at a large restaurant can earn hundreds of pounds a year.

Fig. 84.
Restaurant Kitchen and Chef.

But he cannot get this position merely by reading books. He must begin at the beginning and learn how to do every little process thoroughly well; he must notice everything, and take every opportunity of learning what is really good and what is only pleasant.

It is by doing small things carefully and patiently that he will win success. A little too much heat will spoil all his work in preparation by burning his dishes. Too little heat in the frying-fat will make his cutlets flabby, and prevent their ever becoming crisp. How greatly we should respect a cook who can send us our foods "done to a turn."

Of late years it has become common to buy special foods that are already cooked in the making, and so do not need much cooking or much preparation from us. These are called patent foods. You see them advertised largely. There are meat-extracts, milk-powders, and many sorts of prepared cereals, to say nothing of sauces.

It would be unfair to class all these foods together. Some have been prepared after long years of experiment by people who really wish to help others and save them trouble or do them good. But there are one or two matters connected with them that should be remembered. They cost a great deal more than the nourishing material in them originally cost. For instance, we can buy crushed wheat for less than half what we have to give for a "patent" wheat food. They also pretend to be able to do many wonderful things for everybody. It is better not to believe all we read in advertisements. Foods must always be well tested and wisely used.

Some people tell us that it is better for us, if we are able to give time and thought to the matter, to use foods in a condition as near their natural state as we can get them. But we must not be afraid of taking advantage of everything that may help us. Our best way is to try to understand ourselves how things that we like to use are prepared. Most good firms are willing to show their factories, and it is quite as good fun to see how food is made as to see pictures and other sights. The great thing for us is to use our chances. In this book we have no space to give you laws. We can only show you how to choose, and test, and prepare, to some extent, for yourselves, the foods you need.

XVIII

WASTE NOT

YOU have heard these words, and have seen them written, many times. But that alone will not help you to obey them.

Think for a moment of some ways in which we may waste foods.

I. We may buy over-ripe fruit that will not keep until it can be used. This will end in our having to give or throw some away, or else to overeat ourselves.

II. We may buy too much perishable food, such as meat, fish, milk, butter, green vegetables, and fruit—or we may not store these carefully. Then, again, we may be compelled to give or throw some away.

III. We may miscalculate and prepare more food than can be eaten at a meal.

IV. We may often waste bread by keeping it in a place where it gets dry or mouldy. Most people do not like to eat very dry bread and crusts in their plain form.

To avoid waste of bread :—

Fig. 85.—Bread-pan.

(1) Keep your loaves in a covered jar in a cool place (Fig. 85).

(2) Do not let crusts accumulate. Put them in the oven to dry thoroughly, and crush them up. They then keep for a long time and can be used for frying, or putting into cutlets or into puddings. Crusts are really far more nourishing and more wholesome than crumb, but few people know this. You see, here, a beggar despising crusts (see Fig. 86). Poor man, he knows no better!

Fig. 86.—A Beggar Rejecting Crusts.

(3) If you should happen to have any dry slices left, cut them in small dice and fry them. Then they will be always ready to be heated for use with soup.

(4) If your time is very precious, put any old pieces

in the stock-pot while they are still fresh.

Every morning clear out your bread-pan and empty the crumbs straight into the stock-pot. If you have no stock-pot, give them, while they are still fresh, to the birds. Even birds like to have bread before it has grown mouldy. Then clean the bread-pan itself and put your bread back. This plan will save you a lot of trouble and vexation and time. Any covered jar will serve if you do not want to buy a special one.

If you use meat, be careful how you keep it. People who take meat and meat-soup can put all trimmings and bones into the stock-pot. But they should always use them fresh.

In town it is often difficult to preserve perishable foods even for a day. It will be useful for you to know of some easily-made contrivances for the purpose.

To preserve perishable foods well, we must see that they are :—

(1) Kept cool ;
(2) Protected from dust ;
(3) Protected from flies ;
(4) Away from bad air.

Here is a useful little safe that anybody can make. You can fix it outside any window and you can get to it by just opening the window and reaching the handle of the safe door. In very wet weather you can pull a cord, and thus cover the gauze on the exposed side by a wooden flap which hangs down in ordinary weather. All sides and the door have panels of wire gauze through which air can pass freely. If you have only a sunny window to use, you may still keep your safe cool by having it entirely covered by porous wet material, muslin or flannel. The top should be of zinc, with an edge all round (see Fig. 87).

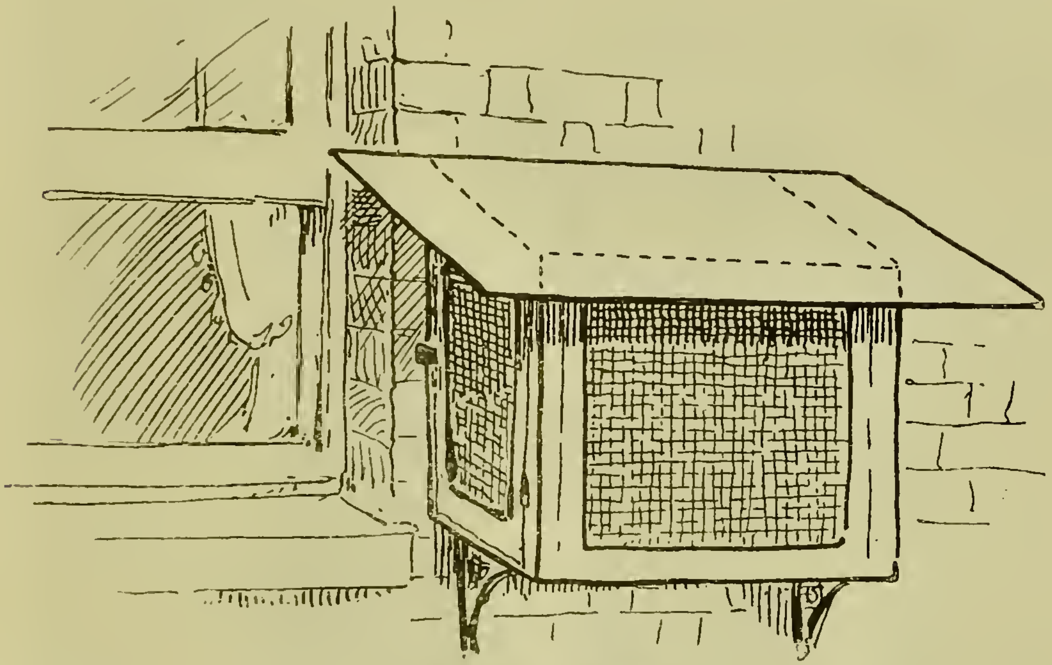

FIG. 87.—SMALL HOME-MADE SAFE.

The muslin cover, if it is moist, serves a useful purpose in keeping out dust; but you must have the covers themselves clean. To wash them, soak them in cold water until the dust drops out. Wring them up and put them in fresh water. Boil them in this, without any soap or soda, for twenty minutes; strain them; rinse them in cold water; and they are ready for use again. Flannel must not be boiled, and is therefore not a good material for constant use. It is a good material to lay on the top of the safe, because it keeps wet so long.

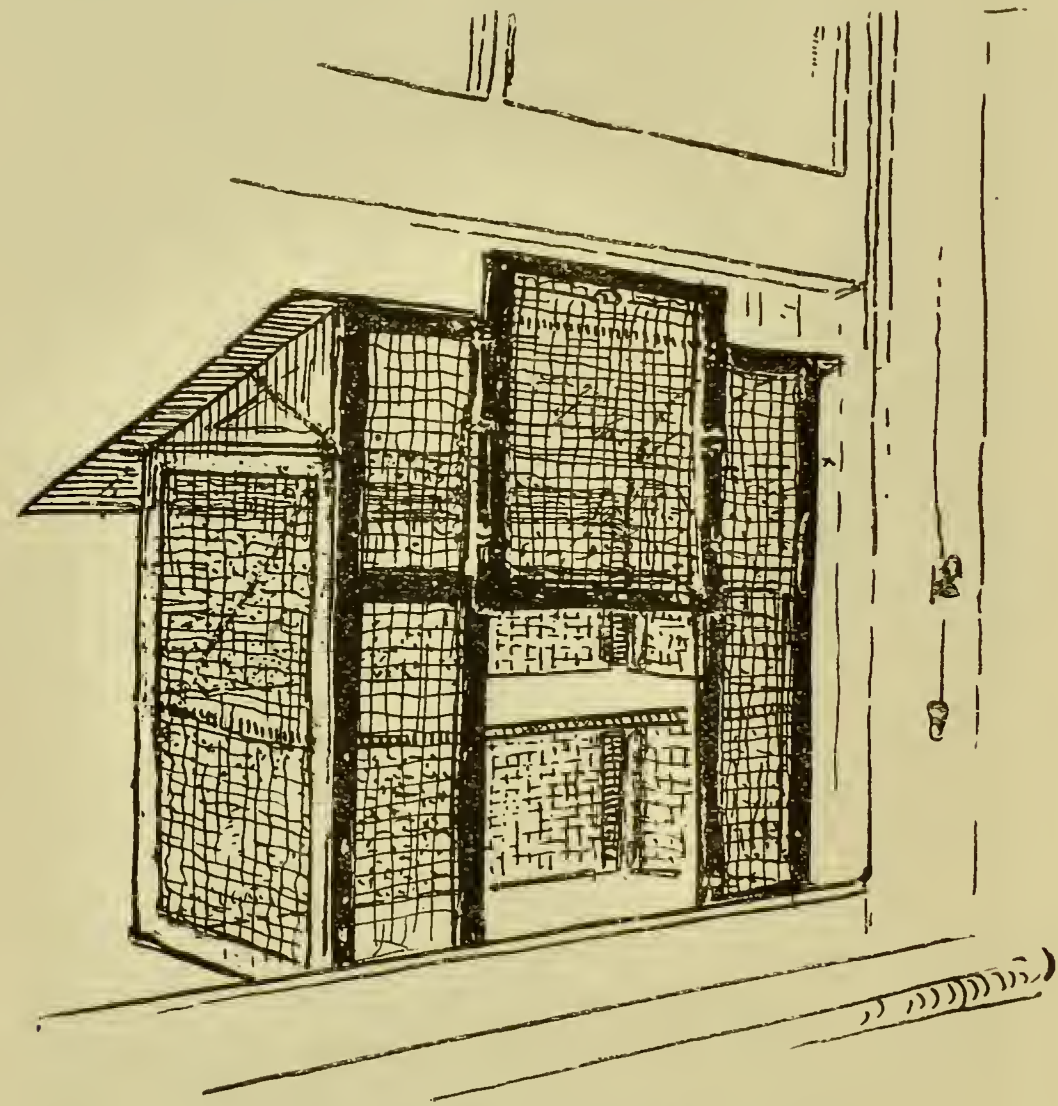

Fig. 88.—A Large Home-made Safe.

The idea of having wet cloths is this. The air, which takes up moisture, also takes up heat that would otherwise go to spoil the provisions.

Just as when we keep food in a vessel with ice round it, all the heat goes to melt the ice: then it cannot do harm to the food.

The second safe is larger than the first, and can be fixed on the ledge of any window which is not specially wanted. You will see that it is on the same principle as the first (Fig. 88).

If you have a garden with a shady corner, you can stand a safe in it, always remembering to fix it so that a current of air goes right through it, and that the air is not made foul by being near any refuse or drain.

In a safe of this kind you can keep perishable foods without much fear of waste.

But perhaps the better plan would be to depend as little as possible on perishable foods. In imperishable foods there is very little chance of waste, and, when they are kept clean, there is little risk of impurity. To preserve them nicely, you should have a cupboard that has plenty of air but as little dust as possible. Suppose you have none, you can easily make one like the illustration (Fig. 89). It will be great fun to copy it. Choose any size you like; I have seen one made from boxes that only cost a few pence. It can be neatly covered with brown paper instead of being painted, if you like. Keep your foods inside it in glass jars with covers of American leather edged with elastic. Clean all your foods before you put them into the bottles, and keep your shelves regularly dusted, and you will never have to throw away spoiled foods.

Dried fruit and nuts are better cleaned in dry flour. If they are washed, however, they should be well dried before they are stored. Make separate paper bags for onions and strong-smelling herbs, and tie them up tightly. Hang them in the coal-cellar where there is nothing they can scent.

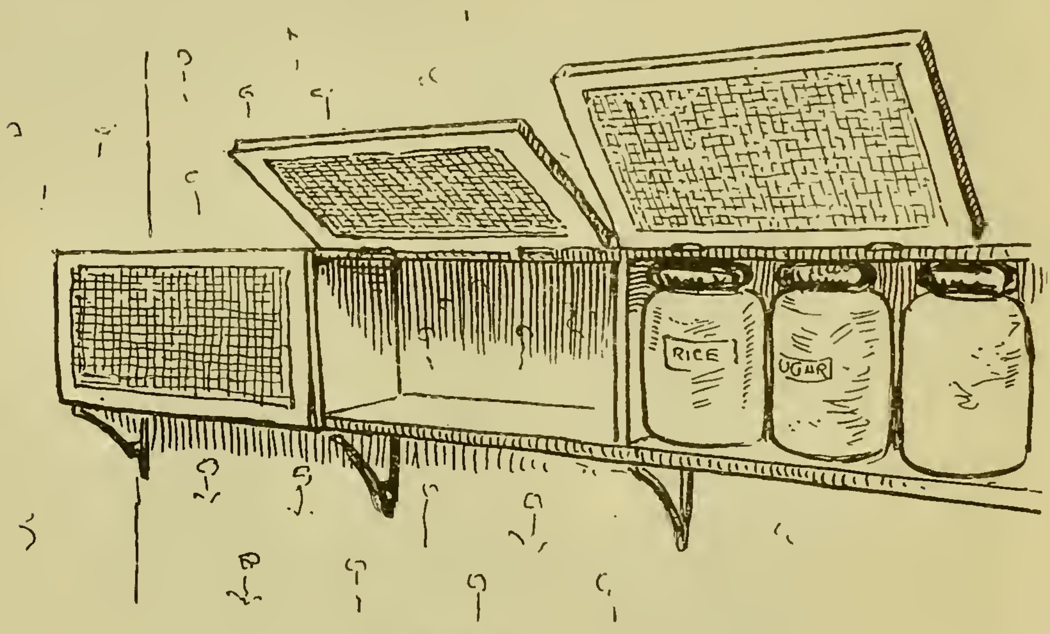

Fig. 89.—Home-made Store Cupboard.

A very important contrivance in a town house is the dust-bin. There are two shapes commonly made. Everybody knows the round galvanised iron kind used for convenience in tipping up, but it is not easily made by anybody. That shown in Fig. 91 can be made by anybody out of an old strong box, covered inside with lead foil. The slit and cover are made to slide between added pieces of wood.

Fig. 90.—Cheap Store Jars.

Never put anything damp into a dust-bin if you can help it. Never allow food to get into a condition that obliges you to throw it into the dust-bin. Burn as much of your refuse as you can. But remember that vegetable skins and outside leaves when thoroughly cleaned are all quite fit for food. Many people never have potatoes peeled. They insist that they should be carefully scrubbed and boiled or baked "in their jackets." Then there is very little loss in the cooking, and they are much better in flavour than when cooked in the old-fashioned way.

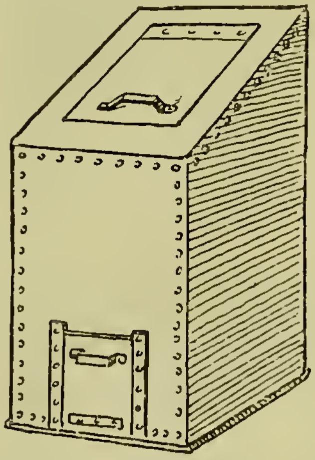

Fig. 91.—Home-made Dust-bin.

This may seem as though time were of no value. Some people say—"Oh, I have no time to fuss over these things." But such people do not remember that order and method really save time as well as money. When you once arrange how things are to be done, and are sure that your way is good and useful, you do all that is necessary with great ease and quickness and without worry. A little time spent each day will keep everything going nicely, and you will never be at a loss, or at a disadvantage.

Butter, cheese, and milk should be kept with a ventilated pot over them, covered with damp cloths, or as in the illustration (Fig. 92). Eggs should have a stand in which each will remain quite upright. In this way (thin end down) they will remain fresh much longer than if they are kept anyhow. Eggs, fixed like this and covered with salt, may be preserved for months without losing their flavour or "going bad."

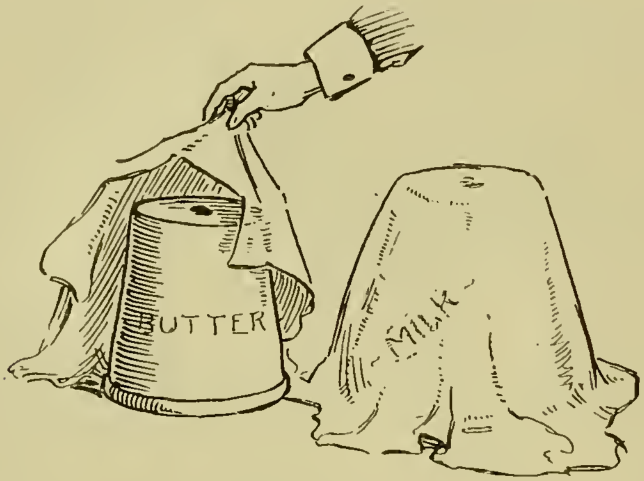

FIG. 92.—CHEAP STORAGE OF BUTTER AND MILK.

Remember that the value of food is destroyed by neglect. First choose wisely. Some people say that expensive things are the best. This is not always so. In meat some of the cheapest cuts have little bone and fat, but with good cooking make most nourishing dishes. Sometimes things are cheap because they are wonderfully plentiful. Then is the time to preserve them if you can. You can preserve all fruits and vegetables if you have time and skill : but there is no space here to tell you how this can be done.

Begin with care and method to avoid waste in small things, and in due time you will find your power growing until you are able to manage successfully very great matters.

XIX

FIVE MINUTES IN THE EDGWARE ROAD

COME and take a walk along the road where foods are so cheap, the Edgware Road, and notice how many of the things which the people are buying are body-building, fresh, and not stimulating and clogging.

First we see the stalls of vegetables and fruits. These are very cheap, and good for the price—cabbages, lettuces, onions, apples, lemons, and so on. They are rich in pure soft water and "salts," and most of them have good flavours. Their juices are among the best and cheapest medicines that can be bought.

But we know now that people would not be wise to live on such things alone; because they are poor in the proteid that builds the body and repairs its waste.

Here, quite close, we find plenty of proteid, in the butcher's meat, and in the fish on the fish-stalls. There are beef, mutton, haddock, cod, crab, winkles steeped in vinegar and pepper, and so forth. Are these foods the best for the poor?

Well, some of the cheaper kinds of meat do not look very fresh and clean, to begin with. Besides, in the flesh-foods there is said to be an over-acid element which has been called "Uric Acid," though this is rather an incorrect name, or the purins. Neither meat nor fish is free from these purins, which sometimes cause illness.

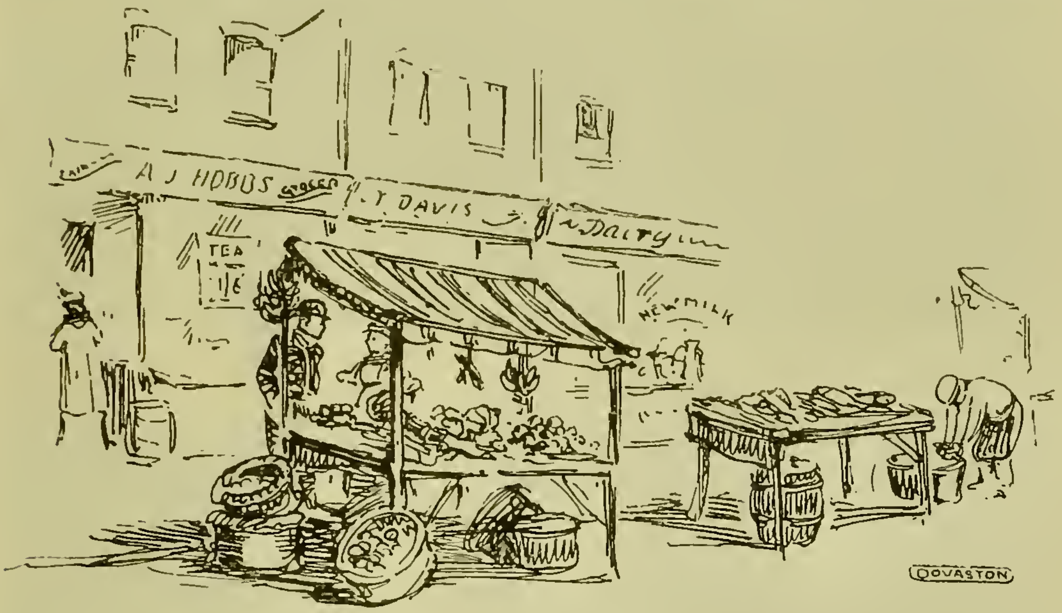

FIG. 93.—IN THE EDGWARE ROAD.

Good fish is probably, on the whole, cheaper than good meat.

In a neighbouring shop are tinned meat and fish. There are objections to these also, quite apart from the purins. Tinned meat and fish are not the safest kind to buy.

Come into the grocer's, now, for a change, and see what foods he has that are rich in proteid, and free from impurities.

Here are hundreds of eggs, not new-laid, but still passable. Eggs agree well with many people, and are very useful in cooking and baking, as you know.

Here also are cheeses of various kinds. Eaten as the main-stay or basis of a meal, some kinds are likely to agree very well. Bread and cheese make one of the most sustaining meals possible.

There are in this shop haricot beans, butter beans, lentils, and split peas. These are very rich in proteid and fattening elements, and they are easy to keep. You could get them cheaper from the grain-merchant's, but even from the grocer's they are cheap. Learn how to cook them and how to flavour them, and you have a useful staple; though they do not always agree if they are taken at more than one of the daily meals.

The various flours and meals are not nearly so rich in proteid. They are, to a great extent, composed of starch, and, especially if eaten in a moist form (as porridges or puddings), with plenty of sugar, are apt to ferment in the stomach and cause great discomfort.

But certain of the flours and the grains, wheat, rice, and barley, etc., are very valuable foods. They are economical, easy to prepare in different ways, and, though not rich in proteid, yet they contain a fair amount of it.

In vain we look for milk-powder, which is

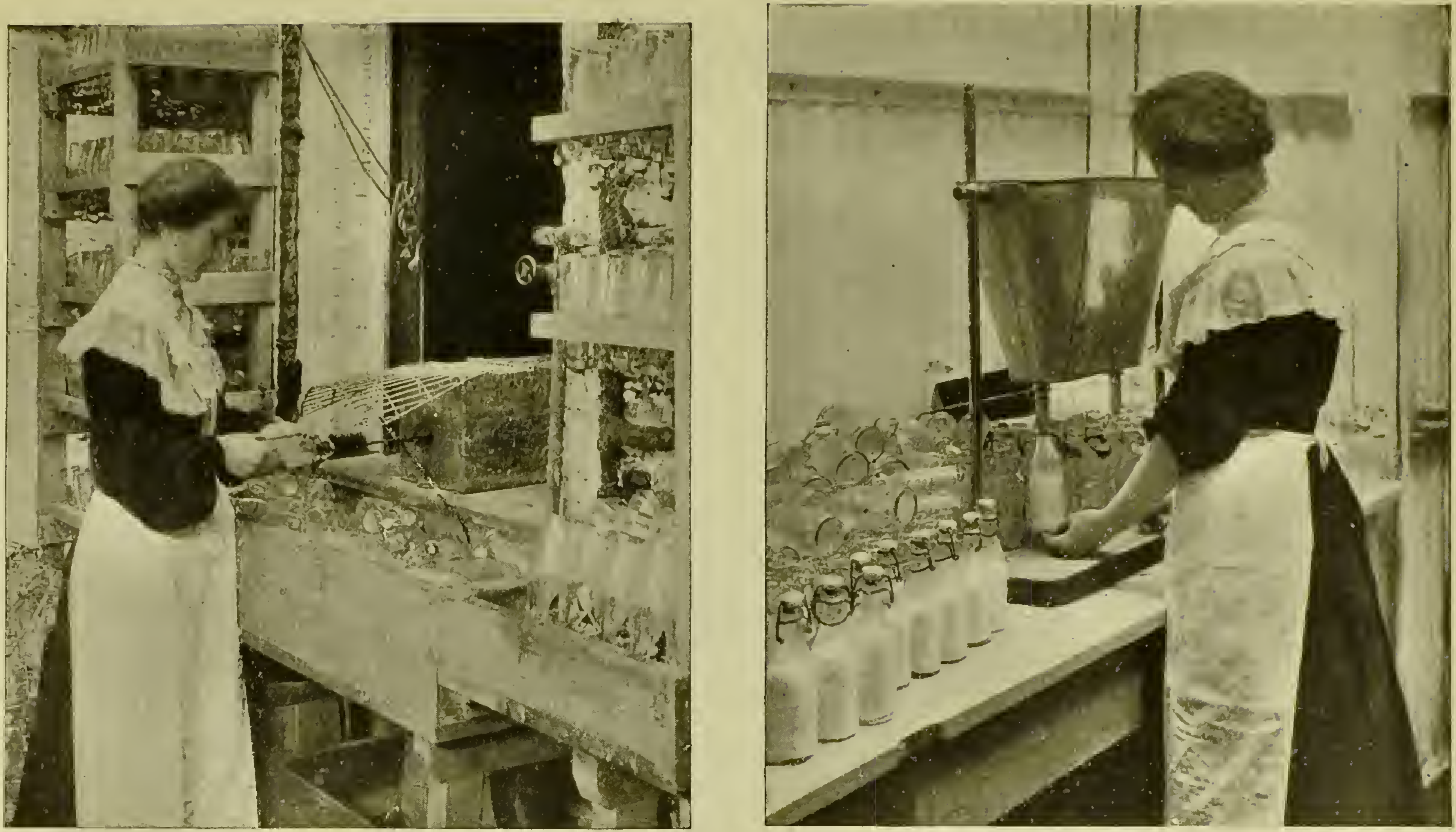

FIG. 94.—A MILK DEPÔT.

Rooms in the Battersea Milk Depôt. From Dr. M'Cleary's book on *Infant Mortality and Infant Milk Depôts*, by the kindness of Messrs. P. S. King and Son, Westminster.

found to be so pure, so rich in proteid and natural sugar of milk, so easy to keep, so easy to add to foods. It is, in its cheapest form, skimmed or separated milk deprived of its water. It is a very precious food-stuff.

Milk there is in abundance. But in a good deal of it there are chemicals to preserve it, and there are germs, and dust and dirt. You will not find much pure and fresh milk in London, at present, although the County Council are trying to make the supply better now.

Walk along past the dairy and you come to several shops with pastry and sweets in the windows. In the street are sweet stalls. Are the contents of these places good foods ?

In the biscuits, cakes, and pastry there is a little proteid, and there is plenty of sugar. In the sweets there is scarcely any proteid at all.

The dried fruits, the dates and figs and currants, in the grocer's and on that fruit-stall, are much better foods. Why are they not eaten more by the people ? They are not rich in proteid, it is true ; but they contain " salts " and a kind of sugar that is far less irritating to most people than shop-sugar is.

But the people, you notice, buy their foods without much regard for food-values. They want a lot for their money. They do not want to bother about choosing, preparing, cooking, preserving. They want just what most people are buying, as cheaply as they can get it.

As to the liquids that they are buying, the meat-juices, the beer or spirits, and the tea or coffee, these things are almost devoid of proteid and are sought for their tastes and their stimulating effects, not for their cheapness. If the people ate better foods, foods better chosen and better prepared, they would not want nearly so much of these stimulants. The syrupy drinks, too, that are so popular are not as a rule healthy either. Certainly they are not nourishing. This can be tried by the people who eat them, if they will weigh themselves.

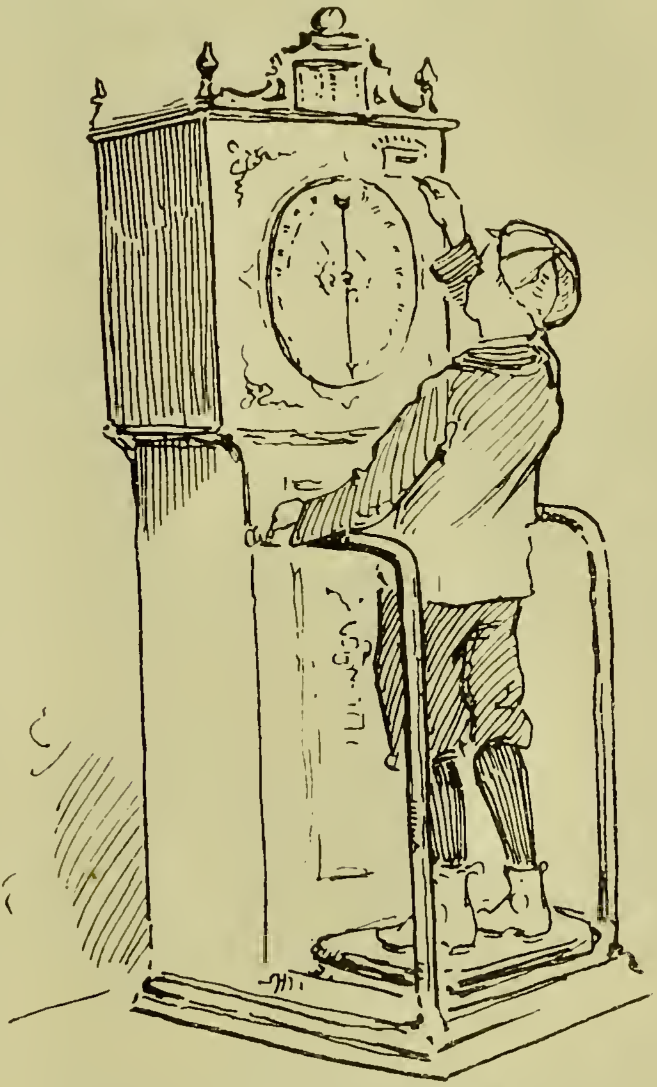

FIG. 95.—WEIGHING MACHINE.

Yet for a small part of the price these people could buy materials for good and healthy lemonade, barley-water, bran-tea, dandelion-tea, and so forth.

But they find such things too much of a trouble. They prefer alcoholic drinks, or else tobacco, things that are not at all good for the young, and are unlikely to be good for most grown-up people either.

XX

FIVE MINUTES IN A NEAT KITCHEN

LEAVING the Edgware Road, we turn down a certain side-street and knock at a brightly polished door knocker. While we wait a moment or two, we notice the cheerful flowers in the little window-box. Then the door opens.

"May we see your kitchen, please, Mrs. J——?"

"Certainly. Come in."

We thank her, and come in just in time to see Mrs. J—— cook part of her evening meal.

How clean the foods look, and the floor and table and utensils, and Mrs. J—— herself! And how fresh the air is.

Everything seems ready and in its place. There appears to be no confusion, no crowding.

Do you remember looking down the area of another house as we passed? The dirty windows were closed, and the room was filthy and disorderly, and so was everything in it, including the cook. What a pleasant change this is, to the healthy-looking cook who seems to enjoy her kitchen and her work.

What a good idea that is in the corner, that little notice-board covered with green baize.

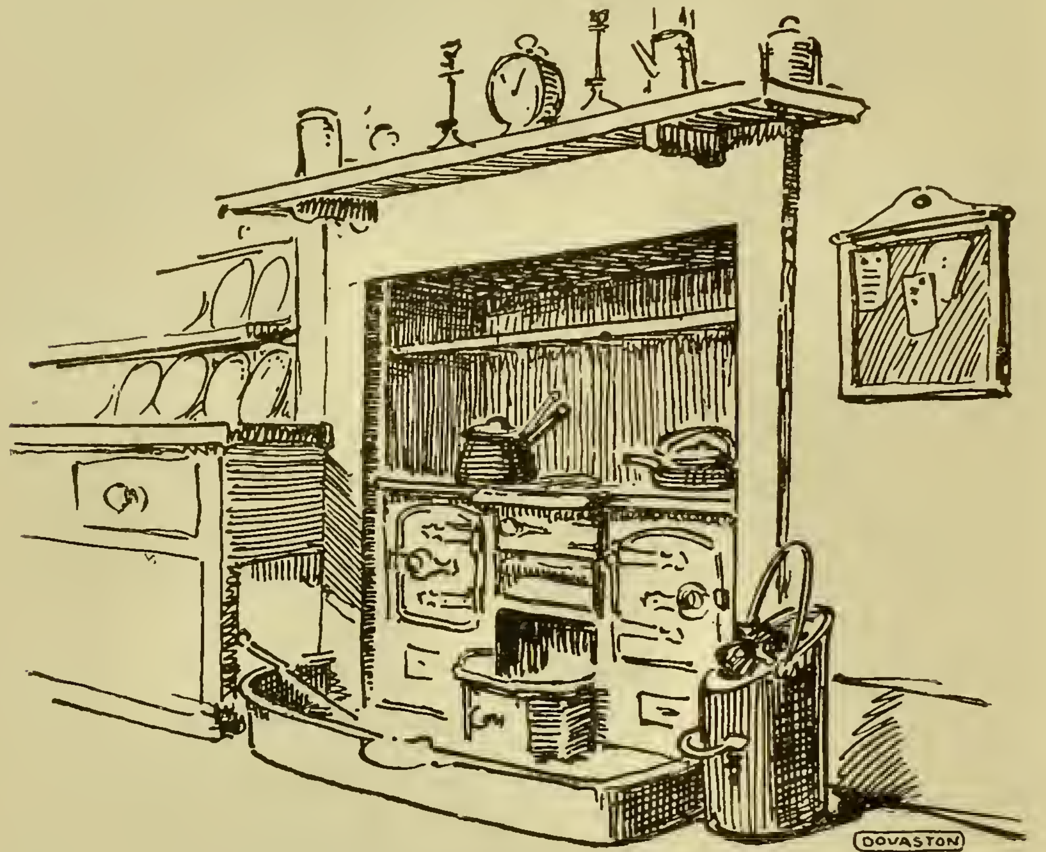

Fig. 96.—A Neat Kitchen.

On it are pinned little memoranda and neat notes of things to be bought, of things to be done, of ways of cooking special dishes, of the time that it takes to cook this or that. (Fig. 96.)

How fresh the vegetables and fruits look, though you cannot see everything; for a good deal is not wanted for this next meal, and so it is in a cool place and covered up.

And how the utensils glitter. There is the double-pan cooker (see Fig. 75) with hot water in the outside pan and cabbage in the inside pan. It is on the gas stove with a tiny yet sufficient flame alight below. Over another jet is the stock-pot (see Fig. 83) full of odds and ends which many other cooks would have thrown away. A soup that smells very good is being prepared: it has been there for several hours now. When the liquid has been strained off, and enough has been taken for the evening meal, the rest will be bottled in a special stopped bottle and kept for use at some other time or else given to some one who wants a meal.

There are the haricot beans soaking. They have been soaking for many hours. Soon they will be ready for boiling.

Come back to the gas stove. There is a light pudding inside it. Over one of the jets is a frying pan with oil: the oil is bubbling. It will soon be boiling, and it will then be still, with a bluish vapour above it. Then it will be ready for frying those cheese balls which the cook is now making from the grated cheese and breadcrumbs. She mixes them, forms them into round balls, rolls them in flour, then in egg, then in breadcrumbs. Now they are ready to be put in the frying basket.

Directly anything is cooked, you will see the cook clean the utensil, or put it under the water tap.

Pans that have had grease in them are filled with hot water; but any vessel that has had milk or starchy and sugary food in it is filled with cold water and allowed to stand for some time, when all the sticky material will drop off readily and cleaning will be very easy.

When the frying is done, the fat is cooled a little, poured through a strainer into a warm jar, and kept for use again. This is covered and put away, and the pan is rubbed all over thoroughly with a coarse dry cloth. The outside of it is washed or polished, but the inside of the pan and the basket are cleaned quite dry from the fat, so that nothing will ever stick to them.

The reason for cleaning the outside of the pan is that we do not want to waste heat. The soot that collects outside each pan so quickly is what is called a non-conductor. When a pan or a kettle coated with soot is put on the fire, it takes a lot of heat to pass through this layer into the water inside. You will find that cleaned pans boil much more quickly than coated ones.

But we must not keep the cook from her work. Just take a look at the shelves which are like those you have been told how to make. (See page 150.) They are well filled with all sorts of necessary things. Don't forget to notice our chart of food-values on the wall. And now I will tell you some of her secrets.

For instance, you would like to know how Mrs. J—— whitens her table. It looks quite spotless. She washes it regularly, using soft soap and sand, with a good scrubbing-brush. Ordinary soap is wasteful and sticky, but a very little soft-soap with sand does much better at less cost.

The walls and floor are quite clean and free from dust. Mrs. J—— manages this by regular and thorough cleaning. The walls are washable and can be cleaned with a long mop. The shelves are all kept free from dust, and the floor somehow never looks dirty. If anything should happen to be spilt, Mrs. J—— goes to a little corner cupboard she has and gets some remedy. Of course the remedy depends on the spill. If it is grease, she uses ammonia. Then, when the spot has been painted over and has stood quietly for some time, she washes it with her usual cleanser and dries it well. Three minutes' work! But it is done at the right time, and at the end of the day Mrs. J—— has no tiresome odd job left over. She can read, or sew, or chat, or do anything she pleases.

You will say she is a fortunate person. She is more than fortunate. She is thoughtful and thrifty and industrious. These three qualities are enough to make anybody rich and happy, but they must be learnt and practised day by day. They do not come to any woman or any man by chance.

XXI

LAST WORDS

AFTER you have read this book you can tell why some meals are not good: for instance, why a meal of boiled cabbage (from which the juices have been poured down the sink), pickles, unripe apples, and gin and strong tea, is of no real use; namely, because it contains too little proteid to build the body and repair its waste, too little fat or oil, and too much that stimulates, irritates, and clogs.

You know now that a far better meal could be had at a far lower price than such a one would cost. You know now how to choose a pure and well-balanced meal, with enough proteid, enough fat or oil, enough starch, enough "salts," and so on.

In a word, you are able to choose a balanced meal for yourself. You must make some and test them as soon as you can.

You would find that, if you secured the proteid and the "salts," the other elements would be easy to obtain from such simple accompaniments as butter or bread.

You would not always have a meal of cooked foods ; you might sometimes have only nuts and fruits for a change, and save cooking (Figs. 97, 98). We should all remember that nuts and fruits may be called "sun-cooked" foods when they are ripe. For the heat of the sun has acted upon them and produced chemical changes which are very similar to those that are produced by cooking. Unripe fruits often make us ill, as insufficiently cooked meals might do. This point is worth remembering. In eating sun-cooked fruits all you have to do is to be sure that they are ripe and sound, and that they are in right proportions and with right accompaniments.

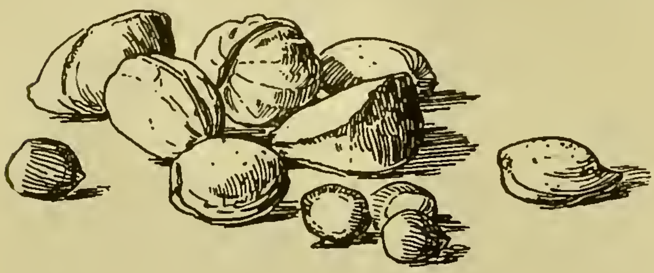

Fig. 97.—Nuts.

Then, again, you might be hurried, and not have sun-cooked foods handy. In this case, you might find a mid-day meal of bread and butter, with grated cheese, quite satisfactory. The other elements necessary for balance you could get at the evening meal.

Anyhow, you would try to avoid meals of wet, tarchy, or "pappy" food, because these meals give your teeth too little work. But if such a meal were given you, you would not swill it down without biting it. Knowing that the starch needs saliva to digest it, you would therefore try to eat very slowly, imagining that you were biting hard food all the time, so that the saliva may flow freely.

FIG. 98.—FRESH FRUITS.

And, as a general rule, while you would not take more of the stimulating and clogging things than you were obliged to, yet, if you felt you were obliged to take some of them so as not to offend the kind people who offered the food, you would eat or drink these things like the sloppy ones, very, very slowly so that they might do you little harm.

Among the undesirable things that you would

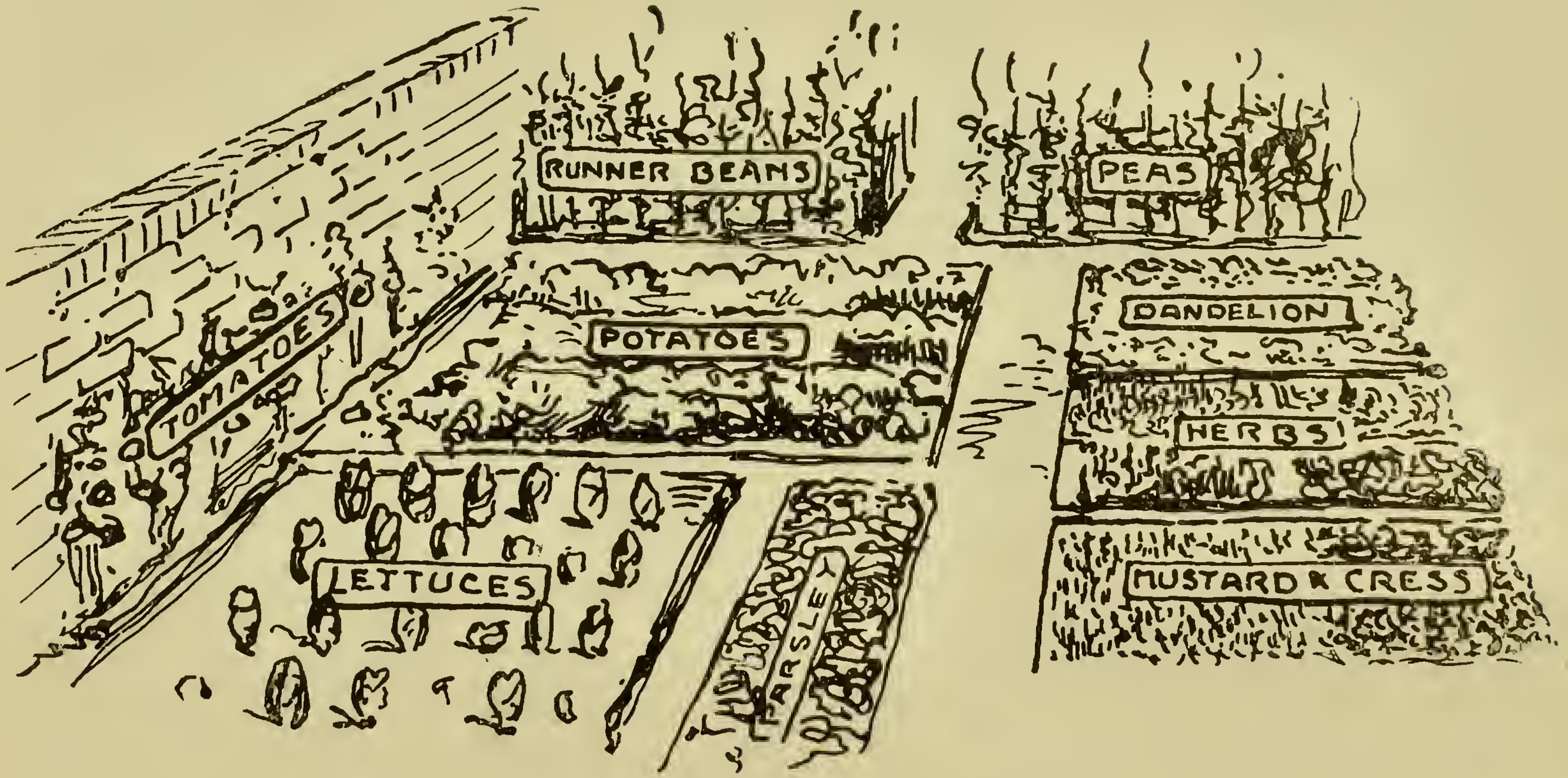

Fig. 99.—A Little Garden.

avoid would be much pepper, mustard, curry, fiery sauce, pickle, strong tea or coffee, or indeed much drink of any kind during meals.

You would avoid also wrong positions of the body, an unpleasant expression of face, wrong thoughts, angry or gloomy or worrying conversation.

While you would make the best of what you have given you to eat, you would meanwhile notice what nourishes you and what does not nourish you, what stimulates you or clogs you, and so forth ; so that, when the time came for you to choose your own meals you would choose them wisely, and would, if necessary, know how to buy them and how to prepare and cook them or even to grow them in the best way possible. (Fig. 99.)

For you must be sure that on the nature of your food and drink, the amount you eat, and the way in which you eat, depends to a great extent, whether or not you have and keep a sound mind in a sound body.

GLOSSARY

Absorbed. Food is said to be absorbed when it has been well broken up and taken into the blood.

Accumulate. To form little heaps or quantities of poison or nourishment. When poisons accumulate in the body they often cause illness.

Adulteration. The practice of putting harmful or useless or cheap substances in foods to make them look or taste nicer. or keep better; or to deceive the buyer.

Advertised. This word means made known to the public. A food may be made known in hundreds of ways, but the most common ways are to praise it in newspapers and on placards, and to send out samples for people to try.

Alcohol. When sugar, melted in water, is made to ferment, or when water is made to combine with a special gas and is then distilled, a fluid is formed that has never been known to freeze, but which can produce a feeling of well-being or dangerous excitement in those who drink it, can take away power to move the limbs freely, and can even destroy life. This substance is contained more or less in beers, wines, spirits, etc., and many wise people therefore avoid these drinks altogether.

Analyst. One whose work it is to find out what our foods and drinks are really made of. If it were not for the analyst we should never know what foods or medicines we were buying, and we should have no way of discovering dishonesty. There is a chemist in every district who is known as the public analyst. Many more of these chemists would be needed if everybody realised the importance of eating pure food.

Antidote. For every substance that has the power to injure or take away life there is probably another substance that will prevent its action. This latter is called an antidote. The commonest antidote is coffee. When a person has taken a poison that makes him feel sleepy, the antidote coffee taken very strong will often be enough to save him from death, especially if he is not allowed to lie down, but is kept moving.

Apparatus. This word is used for any set of tools that are kept for a special purpose. The analyst has his apparatus, the cook has his, the teacher has his.

Appetiser. Many people who do

not get enough fresh air and exercise, and who never allow themselves to feel a healthy hunger, take some food or drink that has a strong and perhaps bitter taste before a meal, in order to arouse the juices of the mouth and stomach and make them ready for their work. The best appetiser is the natural one of hunger brought about by air and exercise and interesting work.

Arrowroot. A fine white powder full of starch, that is made from the food stores of various plants. West Indian arrowroot is made from the underground stem or rootstock of the Maranta. English arrowroot is made from the potato and is cheaper. Oswego arrowroot is made from maize.

Artist. A good workman in any trade or occupation.

Assimilated. Food is said to be assimilated when it has been really taken into the tissues of the body and has become a part of it.

Athlete. In olden days the Greeks called men who tried to get prizes in their public games athletes. Nowadays we have several kinds of athletes, namely the runner, the footballer, the wrestler, and so on. A man who makes his body strong and nimble in order that he may get money by showing himself to others, or by teaching others, is called a professional. A man who takes care of his body and tries to keep it strong and nimble by play or work for the pleasure of doing it, or for the sake of health, not for the sake of earning money, is called an amateur. In each athletic game there are professional champions and amateur champions. The champion is the best player of all those who compete in any particular year.

Balanced. A food is said to be a balanced food when it contains body-builders, and cleansers, and fuel-makers in the proportions needed by the ordinary human body. A balanced food is complete in itself. A balanced meal is made up only of the elements really wanted by the body at the time. These must be given in their right proportion and in their right place. A balanced meal never makes one uncomfortable while it is being digested.

Banana. A fruit that is greatly valued as a food by the natives of the West Indies, Africa, and America. In England we are using more and more every year. A soft kind of meal is made from the dried banana. The banana is not rich in body-building elements.

Banquets. This name is given to rich feasts prepared in honour of an event or a person. Many old English houses have banqueting-halls that were used on state occasions.

Basis. This word is used for the most important of the body-building foods that are found in any particular dish. For instance, in beefsteak pie the basis is beefsteak; in lentil cutlets the basis is lentils; in rice pudding the bases are rice and milk.

Beefsteak. A slice of beef that is generally cooked very quickly over a clear fire, or broiled.

Beef-tea. A liquid, made from beef, that is often given to invalids. It has little food value, but is a strong stimulant.

Biscuit. A crisp cake that is very easy to keep and to carry about. It is best to keep biscuits covered up in a tin in a dry, warm place.

Breakfast. The first meal of the day is really breakfast, whenever it is taken. Some people work better when they have no solid food before noon; others like to have a good meal before they do their work. Much depends upon habit. It may be better for us to train ourselves to take food at times convenient for our work.

Capital. This word is generally used to mean money or wealth of any kind that is left after expenses of trading or working have been paid. It can be drawn upon for future use. The reserve strength is to a body what money in the bank is to a man or woman.

Cells. Very small parts of the body, shaped according to the work they have to do and the place they have to fill, are called cells. Each cell is a complete life in itself, and, as old cells do their work and die, they are replaced by new ones that are nourished by the blood.

Cereals. Certain grasses produce seeds full of nourishment, and in great number. These seeds are called cereals. The cereals have not, as a rule, a high body-building value, but they contain a great deal of starch and some valuable "salts."

Chemicals. Substances used by the chemist to produce effects that are commonly brought about naturally are called chemicals. Chemicals are used in experiments, and by their means we are able to find out many facts about food and its digestion.

Cheque. When a man has more money than he needs for use, he pays what he does not want at the moment into a bank. The banker keeps it for him, and allows him to draw out what he wants by means of cheques, which must, for the sake of safety, be signed by the man who owns the money himself.

Churn. A vessel in which milk or cream is put either to be sent by train or to be made into butter.

Clerk. One who spends his time in writing or office work.

Condiments. Substances that are added to food for taste—not for nourishment—as salt, pepper, mustard, hot sauces, pickles, etc.

Constipating. A food that prevents matter that cannot be used from being carried naturally out of the body is called a constipating food.

Crystals. These are special forms of certain substances that can be produced by the chemist with the help of heat. The diamond is a crystal of the substance called carbon.

Dairy. A room or rooms where milk is kept, or a shop where milk, butter, and eggs are sold.

Dandelion. A plant with long jagged leaves and yellow flowers. The leaves can be used to flavour salads. The root is ground down to make a coffee. The taste is bitter, but the plant is a useful medicine and food.

Dejected. Sad, discouraged, not caring to lift one's eyes up.

Digest. From a Latin word meaning to spread. Food is digested when it is separated into fine parts and these parts are all taken into the places prepared for them. Some of the food is nourishing and goes to the tissues; some is useless, and is sent out of the body as waste.

Dissolve. When certain powders are put into liquid they disappear so completely that—except perhaps for the colour—no one would know they were there by the look of the liquid. These powders are said to be dissolved.

Drain. A large pipe used to carry away refuse from a house. Care should be taken that these pipes are kept clear. Plenty of water should be thrown down them frequently, and nothing powdery or hard should be mixed with it. The powdery things may cling to the sides and gradually choke up the pipes; the hard things may stick across them and cause mischief.

Drugs. Any substances that are used in making medicines or in chemical experimenting are usually called by this name.

Dustbin. A vessel into which ashes and dry refuse can be put until they can be taken away. It is better not to throw wet things in. A dust bin should be kept well covered.

Dye. A stain or colouring substance which is often poisonous.

Edible. That can be safely eaten. Many mushrooms are poisonous.

Effervescence. When gas is trying to get out of a glass of water there is a great disturbance at the top of the water: this is called effervescence.

Elements. The parts of food are called elements—nourishing elements, heating elements, fattening elements, and so on.

Energetic. When people move briskly and put strength into their work they are called energetic.

Essential. What cannot be left out without danger is called an essential.

Excess. When too much food or drink is taken, more than can be used up, one is said to fall into excess.

Existing. Things that are as distinguished from things that might be.

Experiment. When a man puts substances through certain changes in order that he may learn from the effects produced on them they are said to be experimented on. All scientific knowledge is the result of experiment.

Fermentation. A change that comes about through the growth of a tiny fungus. Wine and beer are made by fermentation, and it is the growth of the yeast that makes bread light. A substance that causes fermentation is called a ferment, and one may prevent a ferment from acting by making it too hot or too cold, or keeping away its food from it.

Fit. This word is used to describe a person who is not only well, but able to do his work in the best kind of way.

Flourished. When we say that a nation flourished we mean that it and its members were not only alive, but well and able to do good work.

Garlic. A strongly smelling herb that must be used sparingly. The Greeks and Romans formerly used a great deal of it, and in the South of Europe it is still liked. In England we find that if a salad bowl be rubbed over with a clove of garlic. there will be enough of the flavour to please most English tastes.

Gastric Juice. This juice is made in little bags called glands that form part of the lining of the stomach. When we see or smell nice food this juice begins to flow into the stomach. Gastric juice has in it a fluid called pepsin. This is sometimes taken out of animals and given to invalids as medicine.

Grapes. A well known fruit from which wine is made.

Habits. When we do anything again and again in a particular way, it becomes easier and more natural to us to do it in this way, because we have formed a habit. We must therefore find out good ways before we begin to practise, if we want to get what are called good habits of body and of mind.

Herbal. Belonging to plants.

Imperishable. That do not spoil. Dried foods are for the most part nearly imperishable, if properly kept.

Important. That should not be lightly passed over or left out.

Inattentive. Sleepy. Not noticing what goes on.

Incompetent. Not able to do well what one undertakes to do.

Indigestion. A disease that comes to many who have eaten wrong things, or from having eaten at wrong times, or in wrong ways, or under wrong conditions.

Influence. Power over others.

Injuring. Making anything less useful.

Interest. Money paid for the use of money. If reserve strength is like capital (q.v.), drawing on reserve strength is like using interest and capital as well.

Jaded. Tired, worn out.

Journey. A going from place to place. At first a journey meant the distance travelled in a day.

Laboratory. A place where the hardest and longest experiments are made to find out, among other things, how minerals, vegetables (q.v.) and animals are made. The instruments needed for these experiments cost a great deal of money, and new ones are constantly being invented. Many men and women give their whole lives to working in laboratories, where much care and patience are wanted. To such men and women we owe much of the knowledge that we have about the world.

Leek. A vegetable much used in cooking. It gives a good flavour to soup and is rich in cleansing "salts."

Lentils. The seeds of a plant which grows in moist ground. The red lentil, also called the Egyptian lentil, is the cheapest variety.

Lubricator. Something that softens the particles of dirt in a machine and makes it possible to remove them so that the machine may work smoothly.

Luxuriousness. Spending a great deal more than is necessary on living.

Macaroni. A paste of fine flour made in Italy, mostly in the form of a pipe or a ribbon. Italians eat it with cheese.

Mainstay. A thing to be depended on, as is the mainstay on a ship.

Margarine. A fat made to look

like butter. It is cheaper to use pure margarine than mixed butter.

Medicine. Any food or drink taken to cure a particular disease is called a medicine.

Milk Depôt. Owing to the fact that poor milk is so very bad for babies, and does not give them a chance to grow, some of the Borough Councils have opened shops called Milk Depôts, where mothers can have pure milk of the right amount and strength served to them for a small payment. The photographs of the Battersea Milk Depôt on page 157 show the bottles being cleaned and the milk ready for sale. This depôt is watched by the Borough Health doctor, and he is very proud of some of his babies, who are brought sometimes to be weighed. No mother is allowed to have milk from the depôt unless she has a written note from a doctor saying that she cannot give the baby its natural food.

Millet. A very small grain used as human food in parts of Asia and Africa.

Misfortunes. Things which we would rather be without are often called misfortunes, but good always comes from them if we bear them bravely.

Navvy. A labourer whose work it is to make canals, railways, etc.

Olives. A green fruit growing in Southern Europe and in Asia. Oil is taken from it, and it is also used for food.

Parasite. An animal that lives on or in another of a different species is called a parasite.

Perishable. Foods that soon spoil, like meat, fish, milk, butter, and fresh fruit, are called perishable.

Philosopher. One who knows much about men and life.

Physical. Relating to the body rather than to the mind.

Pickles. Vegetables, fruits, etc., put into vinegar and flavoured with spices.

Porous. Allowing liquids to pass through freely. Full of pores.

Proverb. A wise saying—usually the exaggeration of a truth—put into a form that helps one to remember it.

Purins. Small bodies contained in meat, yolks of eggs, lentils, etc. They are supposed to cause many diseases. Some of them get into the body from outside, others are produced in it by wear and tear, so to speak.

Raisins. Dried grapes which come to England, chiefly from the South of Europe. They are very good foods, but not rich in body-building elements.

Refuse. What is no longer wanted for a special purpose is popularly looked upon as refuse. But it may be found to be of use in some other way, for example, as manure. Refuse is often good material that must be destroyed to prevent its doing harm. In summer, for instance, whole loads of good fruit become refuse through want of care.

Relish. Anything that gives appetite for foods is called a relish.

Repairing. Making afresh parts of a body that have been worn out.

Reserve. What is held back, not being wanted for present use.

Salad. A dish to be served cold.

It may be made of raw or cooked vegetables, and should be eaten with some solid food. A dressing for salads should contain some acid, preferably lemon juice, and some oil.

Saliva. The digestive juices that come into the mouth when we put food into it. Saliva—among its several uses—can turn the starches of our foods into grape-sugar and dextrine. When we eat too quickly saliva gets no chance to act.

Sandwich. A layer of tasty material put between two layers of bread or some similar solid food is called a sandwich, after an Earl of Sandwich, who invented it.

Sauce. A tasty addition to a solid dish which is meant to make it nicer, more digestible, or more nourishing. Sauces are unmistakable tests of good or bad cooking.

Simple Foods. This name is given to foods that, although they may be of animal origin, are not flesh or extracts of flesh. Among simple foods are honey, milk, eggs, cheese, and the plant foods.

Staple. Body-building foods are called staples.

Stimulant. Any medicine or other thing that makes the organs of the body act more readily, but not with more real force, is called a stimulant.

Temperature. Degrees of heat, as shown by a thermometer.

Tonic. Any medicines or other thing that makes the organs of the body act more freely and with more real force, is called a tonic.

Traitor. One who pretends to be a friend and is in reality an enemy.

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